

CAI MI  
451



3 1761 116379728



## Career Outlook      University Graduates

1966 • 67

Department of Manpower and Immigration



Digitized by the Internet Archive  
in 2023 with funding from  
University of Toronto

<https://archive.org/details/31761116379728>

Govt.  
Public

CAI  
MI  
- U5'

# **Career Outlook University Graduates 1966-67**

Manpower Information and Analysis Branch  
**PROGRAM DEVELOPMENT SERVICE**  
Department of Manpower and Immigration  
Ottawa

Hon. Jean Marchand  
Minister

Tom Kent  
Deputy Minister

ROGER DUHAMEL, F.R.S.C.  
Queen's Printer and Controller of Stationery  
Ottawa, 1966

Cat. No.: L2-28/1967

## TABLE OF CONTENTS

### Page

5	INTRODUCTION
5	Graduations
5	Enrolments
6	Graduate Studies
8	Acknowledgements
9	AGRICULTURE
10	ARCHITECTURE
12	ARTS AND SCIENCE (Pass and General)
12	AUDIOLOGY AND SPEECH THERAPY
13	BIOLOGICAL SCIENCES
14	CHEMISTRY
14	COMMERCE AND BUSINESS ADMINISTRATION
16	Accounting
16	COMPUTER SCIENCE
17	DENTISTRY
17	ECONOMICS
18	EDUCATION
21	Elementary
21	Secondary
22	Tertiary
24	ENGINEERING AND APPLIED SCIENCES
26	Chemical Engineering
26	Civil Engineering
27	Electrical Engineering
27	Engineering Physics
28	Geology and Geological Engineering
28	Geophysics and Geophysical Engineering
28	Industrial Engineering
29	Mechanical Engineering
29	Metallurgy and Metallurgical Engineering
30	Mining Engineering
31	Survey Engineering
31	FINE ARTS
33	FORESTRY AND FORESTRY ENGINEERING
35	GEOGRAPHY
35	HISTORY
36	HOME ECONOMICS

## **Table of Contents Cont'd**

<b>Page</b>	
37	Dietetics
38	HOSPITAL ADMINISTRATION
38	INTERIOR DESIGN
39	JOURNALISM
39	LAW
41	LIBRARY SCIENCE
42	LINGUISTICS
43	MATHEMATICS
43	MEDICINE
45	NURSING
46	OCCUPATIONAL THERAPY
46	OPTOMETRY
47	PHARMACY
48	PHYSICAL EDUCATION
50	PHYSICS
50	PHYSIOTHERAPY
51	POLITICAL SCIENCE
52	PSYCHOLOGY
53	SOCIAL WORK
53	SOCIOLOGY
54	TOWN PLANNING
55	VETERINARY SCIENCE
56	PLACEMENT AND CAREER PLANNING
56	Universities and Colleges
57	Technological Institutes
59	APPENDIX
59	Starting Salaries
59	Estimated Graduations
60	Graduate Enrolments
61	Table One—Estimated Monthly Starting Salaries
62-67	Table Two—Estimated Graduations by Disciplines
68-73	Table Three—Graduate Degree Enrolment

## **INTRODUCTION**

DURING the past several years the National Employment Service has published annually a booklet relating to the supply and demand of university graduates. Originally the booklet was based primarily on a current assessment of the employment situation as observed by personnel of the National Employment Service in the conduct of their duties in the placement of new graduates in employment. However, the past few years have seen an increasing interest in the supplying of material for this booklet by leading educators, professional associations and similar organizations, federal and provincial government departments and agencies, and employers active in the recruiting of university graduates. Assistance was obtained from 40 contributors in the writing of the 1964-65 edition, and this figure increased to 87 for the 1965-66 edition. The current 1966-67 edition has been prepared with the assistance of 152 contributors. In addition, many hundreds of employers, educators, university administrative personnel, and others co-operated in the different surveys from which the tabular information is derived.

The chief result of this increased participation has been a change in the scope and use of the booklet, and it has therefore been decided that a new title is in order. Appropriately enough the appearance of this first issue bearing the title *Career Outlook* coincides with the organization of the new Department of Manpower and Immigration, which combines into one integrated manpower agency the National Employment Service and other bodies which were active in the manpower field.

This booklet is intended primarily for the use of undergraduate, graduating, and graduate students at Canadian universities and colleges. Copies are also available for the use of graduating classes of high schools, the prospective employers of university graduates, teachers, and vocational counsellors.

The introductory pages relate to developments at universities and colleges in the general sense, while the main part of the booklet contains material concerning particular groups of graduates. The final section describes the work the Department of Manpower and Immigration carries out at universities and colleges through its offices of Placement and Career Planning. At the end of the booklet are tables relating to starting salaries for university graduates, estimated graduations, and graduate enrolments in science and engineering.

A companion *Career Outlook* publication, relating to graduates of technological institutes, has a similar format and is available on request.

### **Graduations**

Graduating classes are increasing rapidly in size, and many more universities and colleges are involved in the production of graduates than there were a few years ago. Furthermore the variety of disciplines now turning out significant numbers of graduates is growing steadily. It was necessary to list graduations in only 30 categories from 30 different universities and colleges in the 1964-65 edition. The current edition divides graduations into 54 categories from 50 universities and colleges.

It is anticipated that the number graduating in 1967 with first degrees, or their equivalent, will increase by approximately 16 per cent over 1966 to a total of about 44,000, while the number of those obtaining graduate degrees will increase by 20 per cent to a total of 6,500.

### **Enrolments**

It was estimated by the Canadian Universities Foundation in 1964 that the enrolment of full-time students at universities and colleges would increase by 12.3 per cent from 1964-65 to 1965-66 to a total of 200,900 students, and that enrolments would continue to rise rapidly. The total anticipated for 1976-77 was 479,700, and this estimate has been the basic figure used by a number of organizations in their planning. Actually the 1965-66 enrolment was about 15 per cent higher than that of 1964-65 for a total of about 206,000

students. A percentage increase of the same dimension would give a total enrolment of some 237,000 for the 1966-67 academic year.

Reports from Simon Fraser University indicate the successful initiation of the tri-mester system. An enrolment of 7,000 is expected by 1970. Enrolment for 1966-67 is expected to be 900 above the original projections of 1,500 to 2,000. There has been a multitude of reactions, for and against, in the long debate that has developed over the tri-mester system. Supporters of the tri-mester idea generally admit that many problems still require solution, but look to these becoming evident as the tri-mester system is adopted on more and more campuses in the United States and Canada.

Dr. Roger Gaudry, Rector of the University of Montreal, reports that the number of students working for a degree in science and engineering at the university has increased from about 1,000 to 3,000 in the last 10 years. This, he indicates, is a sign of the deep-rooted changes that have permeated the very heart of Quebec to revolutionize Quebec's traditional educational structure. These figures also serve to point out the increase in engineering and science students in all parts of Canada as higher education strives to keep abreast of the sweeping changes of industry brought about by the technological revolution since World War Two.

Another area of growth and change has been the creation of junior and community colleges, or their equivalent. Students usually study at such colleges for a period of two years and then may transfer to a university. Alternatively, terminal diplomas may be obtained without the intention of continuing studies at a university. These colleges have generally proven to be successful.

## **Graduate Studies**

The prodigious advances in all professional fields has created a wide demand for an increasing number of graduate students for both the Master's and Doctor's degrees. This is reflected in the growth of graduate schools. However, growing pains are being felt in many universities because of either a lack of proper facilities or of qualified professors. The Dean of Graduate Studies at the University of Saskatchewan states that numerous students enrolled in graduate studies have returned many years after receiving their Bachelor's degree. This is a result of the changes in industry and the necessity of acquiring further training. The Dean also notes that not all these students are enrolled in courses leading to degrees but rather many are expanding and updating their previous education. The Director of Graduate Studies at Laval University has reported that many students desirous of upgrading their qualifications or of seeking graduate degrees after their undergraduate studies have been refused because of the lack of proper facilities and an adequate number of professors to direct research theses.

This factor, though not a problem applicable to all universities in Canada, has created a situation where, in a number of universities, certain disciplines are concentrated upon rather than the university becoming involved in a wide field of study. This has been noted by the President of Mount Allison University who says that in certain instances this deficiency makes it difficult for the student to choose the appropriate institution for his particular study. However, such universities as McGill, the University of Toronto, and the University of British Columbia offer graduate degrees in nearly all conceivable disciplines. These institutions possess highly-qualified personnel and diverse research facilities to comply with the demands set out in the graduate fields.

The Dean of Graduate Studies at Queen's University, commenting on the overall deficiency in graduate facilities, says that, at Queen's, Doctoral programs in depth are restricted and are limited to the fields which have been traditionally strong at the university. The Dean also notes that the new library and new laboratory facilities have increased the capacity for graduate work. The Dean of the Faculty of Graduate Studies at the University of Alberta records 1,125 full-time students and 283 part-time students. Here again the Dean reports that existing facilities necessitated restricting the number of new graduate students admitted for the 1966-67 academic year. However, a note of

optimism is evident in the university's expansion program whereby it is planned to increase facilities in proportion to the demand for graduate work.

Enrolment figures for 1965-66 at McMaster University show a total of 520 full-time and 427 part-time graduate students. This represents a 26 per cent increase for full-time students but a 16 per cent increase in total enrolment. Full-time graduate students represent a 15.9 percentage ratio to undergraduate enrolment. The Dean of the Graduate Faculty indicates that most of the Ph.D. work is in the sciences, but there are many active Master's programs in the arts. The English and history departments in the Faculty of Arts at McMaster have been recently authorized to offer the Ph.D. degree. In addition to this the Department of Geography notes a marked growth and development in their Ph.D. program. A new Ph.D. discipline has been established in the field of religious science with the department specializing in the religions of India, the early centuries of Christianity, and the philosophy of religion.

The Dean of the Faculty of Graduate Studies at the University of British Columbia reports a 20 per cent increase in graduate enrolment in 1965-66 over 1964-65, bringing the total number of graduate students to 1,600. The Dean expresses the same concern voiced by others in the academic field as to the insufficient facilities restricting proper growth in graduate studies. A further problem is a lack of financial resources in the form of scholarships and bursaries, particularly in the arts and humanities. Graduate enrolments at the University of British Columbia represented eight per cent of the total student enrolment.

For the five-year period 1960-61 to 1965-66 the graduate enrolment at the University of Manitoba doubled from 508 to 1,000. The Admissions Officer at Manitoba reports that in the Faculty of Arts graduate enrolment tripled and the academic period of 1965-66 witnessed an increase of 30 per cent over the previous year.

Carleton University's Dean of Graduate Studies reports a 31 per cent increase in enrolment over the previous year. Though the graduate school is still relatively small, a new Ph.D. program in political science is now in operation and various new Master's programs are under discussion. The Assistant to the Registrar at the University of Ottawa calculates a total enrolment of 757 graduate students during 1965-66 as opposed to 610 in 1964-65. References to graduates here do not include professional schools such as those of medicine and law.

The Dean of Graduate Studies at Dalhousie University has expressed concern over the general deficiency of graduate study facilities. The Dean notes that because of this deficiency the required quota of desirable applicants is not being met. For 1965-66 there were 389 graduate students as opposed to 303 in 1964-65.

The University of New Brunswick in 1965-66 had an enrolment of 308 graduate students, and the Dean of the Faculty of Graduate Studies estimates that this figure will rise to roughly 1,100 by 1975. The Dean speculates that part of this growth will arise from the rapid increase in undergraduate enrolment which will create a need for highly-educated and qualified instructors.

The University of Western Ontario's Dean of Graduate Studies reports a total enrolment of 925 in 1965-66 in contrast to 858 in 1964-65. On the Master's level, 633 students were registered full-time and 49 were registered part-time, whereas in the Doctorate program, 213 were registered full-time and 29 part-time. In 1965 the university conferred 273 graduate degrees of which 31 were at the Ph.D. level.

A further field undergoing expansion is that of postdoctoral studies. The Report of the President's Committee on the School of Graduate Studies at the University of Toronto (1964-65) recorded 69 students engaged in postdoctoral studies. All were enrolled in the fields of science and engineering. The Committee reports that those involved in postdoctoral studies in the arts and humanities in Canada are minimal. The basic requirement for postdoctoral studies at the university should be the ability to undertake independent original research.

The increase in those undertaking postdoctoral studies has been necessitated by the ever-increasing changes and developments in the realm of knowledge, particularly in science and engineering. The Committee suggests that this aspect of education belongs almost solely to the United States, and recommends that steps be taken in Canada, especially by the National Research Council, to make improvements in this important area of education. As the Committee points out, the assistance presently given to those involved in postdoctoral studies is in the guise of fellowships. Many are on sabbatical leave from other universities and in some instances receive financial assistance from their own university. However, these students generally depend upon fellowships or research grants awarded by major corporations to meet their financial needs.

The postdoctoral student does not study for a degree nor does he write examinations. The University of Toronto recommends that postdoctoral students pay only a nominal fee of five or ten dollars and be eligible to use all library and research facilities and have access to the lecture halls.

It should be noted here, in conclusion, that many of the disciplines discussed separately in this booklet include information on graduate studies and therefore discussions on graduate studies will be interspersed throughout.

### **Acknowledgements**

It is impossible to list all of those who assisted in the writing of this booklet since more than 150 contributions were received and used in the writing of the different sections. Wherever possible, however, reference is made in the text to those who assisted in its preparation.

Four organizations were primarily responsible for the surveys and produced most of the statistical information used in the following pages. These were the Education Division of the Dominion Bureau of Statistics, the Pay Research Bureau of the Civil Service Commission, the Office of Economic Studies of the National Research Council, and the Engineering Institute of Canada.

Professional Manpower Analysis Section



## AGRICULTURE

THE Agricultural Institute of Canada predicts that the demand for agricultural graduates in 1967 will even more sharply outrun supply than was the case in 1966 and previous years. This situation, added to the decrease in students entering the study of agricultural science, makes the employment future for agricultural graduates look very bright. Concern has been expressed by a number of deans of agriculture that an increasing number of students of urban origin are applying for admission, contrary to the traditional pattern of students coming primarily from rural areas. Fifty per cent of the 1965-66 freshman class of the Faculty of Agriculture at the University of Manitoba were of urban origin.

Anticipated graduation figures for 1967 show an increase of close to 13 per cent over figures for 1966, a somewhat smaller increase in the size of the graduation class than occurred between 1965 and 1966.

A wealth of job opportunities are now open to the new graduate due in part to the large increase in the number of specialized industries serving agriculture. Government agencies and the universities are undergoing considerable expansion in their agricultural services and thus offer many new openings in the field of research, particularly in the areas of plant and animal breeding, insect and disease control, and food processing. The greatest expansion in demand is in the agribusiness sector of the employment market. The technical service involvement in commerce relating to the agriculture-food industry today is making it imperative that more highly-trained personnel be recruited, and agricultural graduates are recognized as one of the best sources of such personnel, the Agricultural Institute reports.

Employment is available in industry in the processing and manufacture of food, grain, feed, seed, and fertilizer. The farm machinery industry offers employment to agricultural engineering graduates.

Work in resource development as resource development specialists is available to agriculture graduates and includes such areas as wildlife management, soil conservation and land use, and water management. In addition, each year a few graduates find employment on farm newspapers and publications, in market reporting, and in agricultural advertising.

With the increasing number of Canadian farms employing land, livestock, machinery, and buildings having a value of one hundred thousand or more dollars, there is a growing need for farm operators and farm managers with a university degree in agriculture. The trend in this direction is expected to become stronger as farm size and capitalization continue to increase.

The growth of farm size has also brought about the use of consultants in Canadian agriculture. Independent consulting services are expected to expand fairly rapidly and to offer attractive opportunities to graduates. In this connection, Western Canada's first farm economics advisory service was recently established to serve Manitoba farmers. To be known as the Farm Management Consulting Service, this new project will make available to participating farmers the consulting services of a farm management specialist.

Courses of study in agriculture are offered at seven universities — Alberta, Guelph, British Columbia, Laval, Manitoba, McGill, and Saskatchewan — and also at the Nova Scotia Agricultural College. Graduate study in agriculture is available at all seven universities. The curriculum in agriculture at the univer-

sity stresses a strong background in the basic sciences. The advances in agriculture have come from an understanding of the sciences in their relation to agriculture and an application of scientific principles to the problems of agriculture.

The University of Manitoba has just set up a new food science department to replace the department of dairy science and to assume co-ordination of food research projects now undertaken in other departments. This department plans to study new food products, processes, and uses, and to give consideration to merchandising, nutrition, and basic problems in chemistry and microbiology.

Laval University has the only French-language agriculture faculty in Quebec since the schools at Oka and St. Anne de la Pocatière were closed and merged with that of Laval. The Dean of the Faculty of Agriculture reports that this integration brought about a great change in the academic structure of the faculty. By the creation of the departments of food, dietetics, and rural engineering, all phases of agriculture, including plant and animal production, and transformation of agricultural products and food, are taught.

The Dean of the Faculty of Agriculture at the University of British Columbia reports construction has started on a new agriculture-forestry combined faculties complex, marking the first time in Canada that two of the renewable resource faculties have been combined in this fashion. The structure will be the largest single building complex on the U.B.C. campus.

The Dean of the Faculty of Agriculture at the University of Alberta suggests that due to the scarcity of agricultural graduates to fill the many positions now available, salaries for graduates in agriculture have increased more sharply than at any previous time known.

## ARCHITECTURE

CANADA today offers very good opportunities for young men and women in the field of architecture. The Dean of the Faculty of Architecture at the University of Manitoba reports that an unprecedented demand for the services of architects has been created by the rapid expansion and growth of industry and commerce in Canada combined with the attendant growth of cities and the establishment of new ones.

The Royal Architectural Institute of Canada reported 2,613 architects registered with provincial associations in 1964. This was a ratio of 18.8 registered architects per 100,000 urban population as contrasted with a ratio of 13.9 in 1951. For comparison, the number of architects in the United States in 1950 was 21.5 per 100,000 urban population.

The Bachelor of Architecture degree is awarded at seven Canadian institutions—the universities of British Columbia, Manitoba, and Toronto; McGill University, Nova Scotia Technical College, Ecole d'Architecture de Montréal, and l'Ecole d'Architecture de Québec. The University of Toronto instituted an undergraduate course in landscape architecture, the first one in Canada, in the fall of 1965. The four-year course covers painting, geography, botany, forestry, and related subjects.

The architecture courses are, in general, six years in length following honour matriculation. The seven schools will produce a total of 160 honours B. Arch. graduates in 1967, compared to 140 in 1966. Graduates with the Master's degree in architecture are projected to number close to 100 in 1967.

The work of the architect may range from the design of new towns to buildings or groups of buildings of every size and for every purpose. Some architects specialize in related fields such as city planning, urban design, or landscape. New technologies in building methods and materials have given rise to increasing numbers of architects who choose to specialize in various aspects of building science—advanced structures, acoustics, and specialized building design. This diversity of work stems from the same basic education and offers wide scope for the exercise of various aptitudes.

Architecture graduates may enter the profession after two or more years' employment with an established architectural office. Good opportunities for architecture graduates also abound in government departments, research agencies, planning agencies, and industrial and structural organizations. In fact, the Dean of the Faculty of Architecture at the University of Manitoba suggests that the opportunities for research, design, and professional practice in the broad field of environmental design are challenging and unlimited.

The starting salaries for graduate architects



are good with excellent chances for rapid improvement.

## **ARTS AND SCIENCE (Pass and General)**

THE number of graduates in these two fields continues to expand, with an expected increase in 1967 from 1966 of approximately 20 per cent in the number of graduates with pass or general degrees in arts and science. This is approximately the same percentage increase as took place the year before when the 1966 graduating class was compared with that of 1965.

That the value of the arts degree has been widely recognized is evident by the vast variety of occupations in government, business, and industry which are available to graduates from the various pass arts and science courses. Expanding industry requires an increasing number of personnel in research and sales, as well as other types of positions. Graduates, particularly in arts courses, are frequently employed as junior executives, to be trained for later promotion to executive positions. There is also a constant demand for pass science graduates as sales representatives for pharmaceutical and chemical firms.

One specific area in which the demand for graduates has shown an appreciable increase is the electronic data processing field.

Many pass arts and science graduates use the Bachelor's degree as a stepping stone to a professional degree in many fields such as law, education, social work, library science, and medicine.

Within most universities the concept of a strong major in a particular discipline is developing into an accomplished fact. As the age of specialization moves more and more from an abstract idea to a realistic fact, it has become evident that it is necessary for a student to gain a comprehensive grasp of at least one area of knowledge. Thus in a four-year program from grade 12 or the equivalent, a student could possibly take half of his subjects in one discipline. For example, if a student were to specialize in history from a course of 22 subjects, it would be possible to study as many as 11 courses in history, or if the student was involved in a three-year course after Ontario grade 13 or the equivalent, a maximum of 10 subjects out of 16 could be studied in the field of specialization.

The concept of a pass degree with a strong major, whether for arts or science, then gives to the student a comprehensive knowledge of one particular field. This constitutes a strong and important background if one chooses to advance to graduate studies. Further it puts the student in the position of being qualified, with a pass degree, to occupy positions requiring specialized knowledge.

In some instances employment opportunities have opened in industry where honours students were not available in sufficient numbers because they chose to pursue graduate studies. Students with strong majors have then been selected for these positions. In many cases, pass degree graduates are available in the required specialization with almost as many courses as honours graduates.

The past few years have witnessed new developments in the accounting field with minimum requirements for entering this profession being up-graded. The accounting profession is now opening up to pass arts and science graduates, as a number of firms are beginning to employ such graduates as students-in-accounts and as the different professional accounting organizations emphasize the value of having university education before entering the profession. Illustrative of this is the requirement, which is to be in effect in 1970, established by the Canadian Institute of Chartered Accountants. In that year a university degree will be necessary before a person can continue articling.

## **AUDIOLOGY AND SPEECH THERAPY**

THE profession of audiology and speech therapy was developed to meet the needs of persons handicapped in speech and hearing, a handicap considered to be one of the most serious and disabling types. The work of the speech pathologist and audiologist includes the diagnosis and treatment of all types of disorders of speech, voice, language, and the testing and instruction in the use of hearing aids.

Because this field is new, the demand for graduates is particularly high.

Courses of study are provided by the universities of Montreal and Toronto, and McGill University. All three institutions offer training consisting of two academic years, plus prescribed clinical experience in hospi-

tals, rehabilitation centres, or schools. Applicants must possess a B.A. degree or the equivalent before commencing training, and the University of Montreal requires a general knowledge of the French language. The universities differ only in the degree or diploma awarded following completion of the prescribed course of study: Montreal awards an M.A.; McGill either an M.Sc. or an M.Sc. (Appl.), and Toronto a diploma in speech pathology and audiology. The Director of the School of Human Communication Disorders at McGill reports that the Master's degree or a comparable graduate diploma is required for professional practice as a speech therapist or audiologist in most parts of Canada and the United States.

Speech therapy and audiology are two complementary sciences and, in Canada, are taught together so that the graduate may elect to practise in either field and will understand the duties and problems of both. Opportunities for advanced training are available at institutions in the United States and England.

The speech pathologist generally works in association with other specialists in medical, psychological, and educational fields due to the complex nature of some speech and hearing problems. They are employed in hospitals, rehabilitation centres, clinics, with mobile provincial diagnostic units, and in special schools for the handicapped or deaf, as well as in the regular school system. Some enter private practice and some lecture or carry out research in university departments of speech and hearing.

The growing awareness of the needs of patients has led to an expansion in treatment facilities, and a number of provincial governments offer assistance to those wishing to pursue studies in the field of audiology and speech therapy.

Starting salary rates for qualified personnel are increasing, with average starting salaries for 1966 graduates exceeding \$5,000 per year.

## BIOLOGICAL SCIENCES

THE biological sciences are represented by a wide spectrum of disciplines including bacteriology, botany, biochemistry, anatomy, zoology, pharmacology, physiology, genetics, general and marine biology, the agricultural sciences, and others. From the nature of the subjects, it is evident that at the practical

level these range from the natural sciences, through the food and pharmaceutical sciences, to the health sciences. As food production and health of the population are of prime importance in any national program, there is an ever-increasing emphasis on research and development in the biological sciences. This, together with the growing number of universities and faculties, makes the employment outlook for new graduates very bright.

In respect to employment opportunities, these should be considered at two levels: graduates in general biological science courses, and graduates in the honours biological science courses. Employment opportunities for the former are excellent and in a wide variety of fields. Examples of these fields are: in quality control programs of the pharmaceutical industry; the expanding food processing industry; the Food and Drug Directorate and other directorates of the Federal Department of Health and Welfare; in agricultural research and control stations; in fisheries surveys and research stations, and in Northern Affairs. There is also an increasing demand for these graduates in departments of agriculture, health, lands and forests, and other control and research stations of provincial governments.

Honours graduates in the biological sciences are encouraged to enter the more academic employment opportunities or to proceed to higher degrees. There is a growing demand for biological science teachers in secondary schools. As well, there is a strong demand for biological scientists in universities, in research institutes, and in federal and provincial departments engaged in research and development. Even more important, the large number of new universities, the increasing enrolment in universities, and the rapidly expanding health sciences have brought about an urgent need for biological science graduates possessing the M.Sc. or preferably the Ph.D. degree, for professorial as well as research positions.

The Canadian Federation of Biological Societies estimates that there has been an eight to 12 per cent increase in the number of graduates in these sciences in the past few years. Despite this fact, the demand for biological scientists, especially those with honours graduation and those with higher degrees, has exceeded the number of scientists trained annually in this field by some 12 to 14 per

cent. In large part, this has been overcome by employing biological scientists trained in other lands. It is estimated that this imbalance will likely increase in the next five to seven years when it is hoped parity will be reached. This analysis is based on the number of students entering the biological sciences, the increasing number of opportunities available, and the period to complete the necessary education for those entering university.

Salaries in this field vary somewhat, depending on the academic discipline, but in general are showing an upward trend amounting at present, to some five per cent per year.

In the last 15 to 20 years there has been a conspicuous increase in the scientific application to medicine. This increase has been compounded by the growing number of hospitals, especially teaching hospitals. This has led to a most remarkable increase of employment opportunities in these hospitals, especially for graduates in bacteriology, biochemistry, physiology, genetics and histology.

Though employment opportunities for the graduates in any of the biological sciences are excellent and vary to such a wide degree, only a few of these have been available for the medical laboratory sciences. In order to cope with this situation, a number of universities are now offering degree and diploma courses in the medical laboratory sciences. Among these are the University of Alberta (Edmonton), the University of Saskatchewan (Saskatoon), the University of Montreal, and Laval University. Together with this, there are an increasing number of affiliated schools offering two-year diploma courses after senior matriculation, as well as extension courses in advanced medical laboratory technology. These latter include the University of British Columbia (Vancouver General Hospital), the University of Saskatchewan (Regina), University of Manitoba (Winnipeg General Hospital), the University of Western Ontario (Victoria Hospital), and Dalhousie University (Victoria General Hospital).

Starting salaries in the medical laboratory sciences have been showing a greater than average upward trend resulting, no doubt, from the still critical shortage of qualified candidates.

## CHEMISTRY

THE Chemical Institute of Canada reports

that the demand for chemists continues to be great, and all graduates appear to have no difficulty in securing positions.

An increase of more than 20 per cent is anticipated in the number of honours chemistry graduates emerging in 1967 from the more than two dozen universities offering undergraduate courses in the field. Graduations at the Doctoral level consistently exceed the number graduating during preceding years with a Master's degree. As well, the Chemical Institute notes that in recent years approximately the same number of students have received the Doctor's degree in chemistry as have received the honours Bachelor's degree. The Institute feels that this indicates that the great majority continue to graduate work, and also that students from other countries are attracted to Canadian university chemistry departments for graduate work.

The fact that very few Bachelor graduates in honours chemistry are available for employment has increased the demand in industry for those who have a degree with a major in chemistry. For those interested in a career in production, sales, or control, such a degree may offer a good starting point.

Employment may be found in a wide variety of fields starting with work in federal government research projects in the chemical aspects of nuclear energy, fisheries, forest products, agriculture, food and drugs, and national defence as well as in the pure and applied research programs conducted by the National Research Council.

There are opportunities for honours chemistry graduates as science teachers in secondary schools, and graduates possessing Ph.D. degrees are in demand to handle the rapidly increasing enrolments at universities. A Ph.D. degree is usually required of those wishing to enter industrial or government laboratories as research chemists.

A considerable increase in starting salaries for chemists at all educational levels is noticeable this year.

## COMMERCE and BUSINESS ADMINISTRATION

THE Acting Dean of the School of Business at Queen's University points out that graduates of business possessing a B. Com. degree after a four - year honours course are found by employers to have the qualities sought in a

liberal arts graduate plus a vocational flavour. The Acting Dean states as well that graduates of Queen's B. Com. course are invariably in strong demand with industrial, commercial, financial, and service enterprises. The Faculty of Commerce and Business Administration at the University of British Columbia suggests that the demand for commerce graduates continues to be very high, and that the enrolment in the undergraduate program at the university has increased substantially in the last two years.

McGill University reports a major revision of its B. Com. degree program and the inclusion of a new course entitled management decisions. This course is designed to be particularly useful to students entering either business or government. As well, the groups of specialization have been radically broadened and now include a sequence of courses in international business and in managerial accounting. McGill also plans to have an undergraduate course in operations research for students with an aptitude in mathematics and applied economics. The Director of the School of Commerce at McGill is hopeful of a considerably increased enrolment due mainly to the new program.

The University of Sherbrooke's Faculty of Commerce is now to be called the Faculty of Administration and will grant a Bachelor's degree in administration as well as a Master's degree in business administration. This latter degree will be considered a French M.B.A. and candidates for the course must possess a specialized degree such as a B.Sc. in engineering, an LL.D., or a Master's degree.

Graduates in commerce and business administration with Bachelor's degrees are expected to number as high as 2,100 in 1967, compared to a total of less than 1,900 in 1966. Thirteen Canadian universities offer graduate study in commerce and business administration, three of which are at the Ph.D. level. These are Western, Montreal, and Laval. York University has instituted a Faculty of Administrative Studies which will have as its principal divisions a school of business and a graduate school of business (both to open in September, 1966) and a school of public administration (to open in September, 1967). This will be the first professional faculty on the York campus. The Director of the Graduate School of Business at McGill University notes that the range of programs in

business education at the graduate level offered in Canada has widened considerably in the last few years. He suggests that Canadian students are now offered about the same range of courses as are students in the United States.

Graduates in arts, science, engineering, pharmacy, commerce, law, and agriculture are among those eligible to study for the M.B.A. degree. The University of British Columbia reports a considerable rise in enrolment in its M.B.A. program, while Queen's University notes a significant number of its commerce graduates now proceeding to professional programs of education, such as accounting, law, and graduate courses leading to a Master's degree.

There are many avenues of employment open to graduates in commerce and business administration today. Many graduates find employment in accounting, sales, advertising, and personnel work, and a number take positions such as trust officers, investment analysts, in market research, in banking, and in government service as junior executive officers.

The Retail Council of Canada suggests that the retail trade, employing 800,000 people, is the biggest employer in the service industry sector. The larger and medium-sized firms in the trade recruit considerable numbers of graduates in commerce and business administration each year for careers in such areas as merchandising and sales promotion, advertising, buying, personnel training, methods and market research, and data processing.

The Faculty of Business Administration and Commerce at the University of Alberta suggests that the most rapid area of growth in its Faculty of Business Administration in the last several years has been in the marketing specialty. Here, they report, the demand far exceeds the supply of students, and commerce graduates with the marketing specialty are now being used extensively in industrial sales, advertising, and merchandising.

Some graduates from an honours commerce course continue their studies to become lawyers or to teach at the university level, and some become secondary school teachers. A fair number of honours graduates go into business to pursue careers in management.

## **Accounting**

The Canadian Institute of Chartered Accountants once looked mainly for commerce graduates as students. Now, however, graduates of other faculties such as arts, engineering, law, and science are being encouraged to enter public accountancy. The Institute of Chartered Accountants of Ontario reports that their annual intake of university graduates is approximately 40 per cent commerce and 60 per cent arts and related faculties. Commerce graduates who meet certain requirements in their undergraduate courses can complete their formal studies in two years, although they are required to undertake a third year of practical experience before becoming eligible for membership in the Institute.

Three Quebec universities — McGill, Laval, and Montreal — offer the Licentiate in accountancy. Under this program, Licentiate students write, in their final year, the chartered accountant's uniform final examinations, and by successfully completing these examinations and receiving their Licentiate, they are eligible for admission to the Institute of Chartered Accountants of Quebec without further examination. A similar situation exists for certain graduates of the University of Sherbrooke. A combined B. Com.-C.A. program which grants both degree and diploma within a six-year period by service in the profession and study at the university is offered by the University of Saskatchewan.

The Society of Industrial and Cost Accountants of Canada reports that employers seeking qualified accounting personnel give preference to university graduates who have or are working towards specialized professional qualifications. The Society offers a five-year program, which, combined with four years of practical experience and the production of an acceptable thesis, gives a candidate the right to call himself a Registered Industrial and Cost Accountant. A university graduate who has majored in accounting may be granted exemption from the courses and examinations in the first three years of the program and given remission of two years of service. Such a graduate will then be able to fulfill the requirements for R.I.A. qualifications in two years. The Society, which graduates about 250 students each year, notes that approximately 15 per cent of its annual student body are university graduates with the majority of these being graduates in com-

merce or business administration.

The Certified General Accountants Association reports that opportunities for advancement as a Certified General Accountant are unlimited. The Association gives additional credit to applicants to its course who are holders of a university degree. Persons bearing the title, C.G.A., are employed in industrial, commercial, and governmental work and are engaged as public accountants in the provinces where permissive legislation exists.

The required course of study that C.A. students must follow and the examination that they must write vary from province to province. There are ten provincial Institutes of Chartered Accountants responsible for determining what the course of studies will be. The Canadian Institute prepares the uniform examinations used by the provincial organizations.

Chartered accountants may work as public accountants thereby offering to the public professional services in auditing and accounting, or they may occupy positions in industrial, commercial, governmental, and academic organizations. At present, about half the chartered accountants in Canada are practising as public accountants.

## **COMPUTER SCIENCE**

THE Chairman of the Computer Society of Canada reports that the demand for graduates in computer science is increasing by at least 25 per cent yearly and will definitely continue to do so in the foreseeable future.

The recent strides, the Chairman suggests, made in the application of computers to such diverse fields as medicine, law, education, psychiatry, industrial process control, banking and finance, government, and all forms of industry will create a large demand for persons qualified to perform development research in all these areas. The Chairman predicts that one of these areas — education — will create, within several years, a large demand for teachers of electronic data processing in universities, technical schools, business schools, and the secondary schools.

Most Canadian universities now offer a program in computer science, either as a degree or diploma course or as an option in a discipline such as mathematics. The University of Toronto offers a diploma course in computer science, with 15 students enrolled

this year, and a Master's and Ph.D. program as well. The University of Toronto estimates that the total graduate enrolment in computer science at the institution will be about 90 by 1972. The University of Western Ontario offers an honours program leading to a B.Sc. degree in computer science and has just recently instituted a computer science major in the three-year program. At the graduate level, Western has a joint program with mathematics leading to a Master's degree and expects to graduate six students in 1967. The Head of the Computer Science Department at the University of Western Ontario suggests that students graduating from any of these programs are expected to go into industry as systems analysts or programmers or to go into research or teaching in computer science. The University of Alberta is the third university to offer the Master's degree in computer science.

The Department of Computer Science at the University of Toronto notes that starting salaries are good and that graduates can expect close to \$600 per month.

## DENTISTRY

It is reported by the Chairman of the Sociology Department at Carleton University that Canada faces a critical shortage of dentists. In a study that the Chairman carried out for the Hall Royal Commission on Health Services, he noted that Canada placed fourteenth in a study of 20 countries in its ratio of dentists to total population. Canada's national average is one dentist for every 3,108 residents compared to that of the United States at one to every 1,900 population. He further noted that Ontario has rural areas with ratios as high as one dentist per 20,892 persons.

His study also showed a serious maldistribution of dentists across the country, with British Columbia having one for every 2,406 persons compared to Newfoundland's one dentist for every 10,648 residents.

Canada now has more than 6,000 dentists of whom about 150 are women. The demand for dentists, as illustrated in the Hall Commission Report, is high, and Canada's growing population will increase the demand for additional dentists in years to come. The Hall Report and, as well, many organizations look to fluoridation as a long-term step toward dental health without increasing the demand

for dental services. The Chairman also suggests in his report that there should be more women dentists, and more auxiliary helpers to free the dentist from routine work.

The Canadian Dental Association reports that the number of dentistry students engaged in Master's work in Canadian universities jumped from five in 1960 to 34 in 1965. However, the number undertaking Doctorate studies during 1965 fell by eight from a total of 40 in 1960.

Canada now possesses seven schools of dentistry located at the University of Alberta, McGill University, the University of Toronto, the University of Montreal, Dalhousie University, the University of British Columbia, and the University of Manitoba. These schools graduated about 270 dentists in 1966, and expect to produce a similar number in 1967. An eighth dental school is to be built at the University of Saskatchewan in Saskatoon and should be able to receive its first students in the fall of 1967. This construction comes at the request of Saskatchewan dentists who report only 200 in that profession to serve a population of 950,000.

Some dentistry graduates find employment in federal, provincial, and municipal governments, but most dentists are self-employed. A small number of graduates each year find positions with hospitals, industry, and school boards.

Starting salaries for dentistry graduates are fairly high and compare well with those for medicine.

## ECONOMICS

THERE is an increasing number of opportunities for economists in government service, industry, and the universities. Those with Bachelor training will find their main outlets in the Civil Service and private business, with journalism also a possibility.

The President of the Canadian Political Science Association suggests that for professionally-trained economists, especially those with training in quantitative methods, there is, in addition to academic employment, a growing demand by the research departments of private businesses and business associations. A small but important market for economists exists as well in the international organizations such as the OECD and the World Bank.

The Association's President further stresses the growing importance of graduate training, especially in statistics and econometrics, in the preparation of a professional economist.

In the field of graduate studies, the University of Saskatchewan offers a Ph.D. degree in economic history and a special program in the political economy of communications. Memorial University of Newfoundland gives a Master's program oriented toward economic development with particular emphasis on resource industries, labour force problems, and regional development, while the University of New Brunswick offers the Master's degree in four areas — microeconomic theory, macroeconomic theory, business cycle theory, and public economy, and national and regional economic development. All of the Master's degree courses in economics at New Brunswick give special attention to the problems of the Atlantic provinces.

The Institute for Economic Research at Queen's University offers the Ph.D. degree in such fields as international trade and finance, economic history, labour economics and industrial relations, and mathematical economics. The other major universities of the country, such as the University of British Columbia, the University of Western Ontario, McGill University, and the University of Toronto, have also for many years offered training leading to the Ph.D. degree in a variety of fields.

Salaries for starting economists relate generally to those in other professions requiring similar academic training. The President of the Canada Political Science Association reports, however, that starting salaries for academic economists are higher than salaries in other university departments.

## EDUCATION

THROUGHOUT the country the pace of change in education continues unabated and is surpassing that of the past few years. Increasingly the federal government is being asked to become more deeply involved in Canadian education. In the spring of 1966, the Canadian School Trustees Association reiterated once again its feeling that there should be a Federal Office of Education. While the Association recognizes "that the making of laws in relation to education is the exclusive right of the provincial governments", nevertheless it feels that a Federal Office of Education "could promote discussion among educators and laymen on common goals through research and the publication of research findings, and make accurate information available to all. One of its main functions should be to provide interpretation of the educational and technical needs of Canada and promote a general understanding of Canadian objectives, both in Canada and among other nations."

During the 1964-65 academic year, the Dominion Bureau of Statistics reported that there were 37,658 persons enrolled full-time at teacher-training institutions. Less than half of these, 15,918 were enrolled at degree-granting institutions. However, almost 20,000 of the remaining 21,740 were enrolled at teachers' colleges in Quebec and Ontario. The balance were enrolled at institutions in Prince Edward Island, Nova Scotia, New Brunswick, and Manitoba. Manitoba is in the process of bringing all teacher education under the jurisdiction of degree-granting institutions, and in 1965 Prince Edward Island passed legislation establishing Prince of Wales College as a degree-granting university. All teacher training in Prince Edward Island is now given either at Prince of Wales or at St. Dunstan's. Quebec is in the process of reforming its educational system. One result of this will be to bring all teacher training in the province under the auspices of degree-granting institutions. In Ontario the Education Minister stated in 1966 that during the next few years there would be closer co-operation between teachers' colleges and universities. This statement is in line with the Ontario Advisory Committee's recommendation that every person entering the teaching profession should be required to have a university degree by 1970. The Canadian Teachers' Federation notes that most newly





constructed teachers' colleges in Ontario are located on or near university campuses.

The New Brunswick government is moving toward a major overhaul of its education system as indicated by legislation which was dealt with in 1966 and which brings about considerable uniformity in the provincial educational system.

The Canadian Teachers' Federation reports on the introduction of internship programs in the training of teachers in Canada. In these programs, prospective teachers receive intensive experience in the schools, under the guidance of qualified teachers. In Alberta, the internship program is operated as a part of the recruitment program of local boards of education. At the University of Saskatchewan, an experimental Diploma Internship Course for graduates of other faculties is in operation. This program includes provision for four months of continuous employment as an intern. At Simon Fraser University in British Columbia, a regular program for all education students includes two lengthy periods of work in the schools, one of eight weeks and the other of sixteen. The Ontario Department of Education recently announced an "internship plan" for training university graduates of mature years as elementary school teachers.

In Quebec a technical education normal school has been established with five divisions of instruction. These are: related vocational training; theory of pedagogy; teaching psychology; general knowledge, and courses on teaching techniques.

The many changes taking place in the educational pattern have resulted in a recognition of the need for more research and development in educational fields. In 1965 the Ontario government established the Ontario Institute for Studies in Education. The new institute will incorporate the former departments of Educational Research and of Graduate Studies of the Ontario College of Education, as well as the Ontario Curriculum Institute. Among the departments which will be established by the Institute are a department of curriculum and divisions of instructional technology, planning, educational foundations, educational administration, tests and measurements, information, and field services.

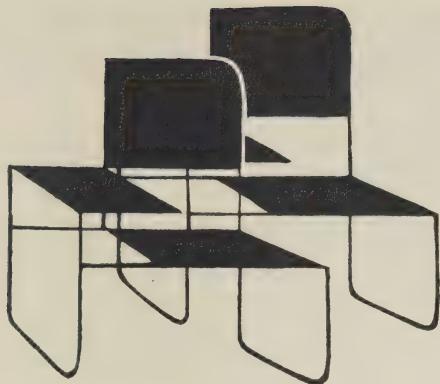
The Manitoba Teachers' Society established a commission in 1965 to study the

field of reading. This study includes how reading is taught in Manitoba, what are the results of this teaching, what research is being done elsewhere, and what kind of instruction in reading methods is being given at the teacher education institutions in Manitoba.

In Alberta the Executive Secretary of the Alberta Teachers' Association stated early in 1966 that now the emphasis should change from that of higher salaries, job security, and fringe benefits to one of research and development. He urged the need for an institute, the prime purpose of which would be to study current trends in societies and the corresponding ones in education. The General Secretary of the British Columbia Teachers' Federation, writing in the Alberta Teachers' Association magazine, predicted that future teachers would be organizers of learning, more than they would be imparters of information. Dr. Patton foresees a need for teachers to have optimum freedom to experiment and to enjoy some of the academic freedom and facilities that university professors have had traditionally.

Technological changes are also being felt to an increased degree in the school systems. In Ottawa the public school board authorized, in the spring of 1966, a project to establish two-way television communication at four schools between classroom and studio. It is possible that the first publicly-owned television network devoted solely to education programming will be established in Alberta in the near future. Studios would be located in about six or seven different points throughout the province with the first being established in Edmonton. This is the substance of a brief submitted to the Alberta government and backed by television associations in Edmonton and Calgary.

The Minister of Education for Ontario announced the establishment of a computer network in the spring of 1966. This network would have regional data processing centres throughout the province. The first regional centre will serve as a pilot project and will be in operation by the spring of 1967. The Minister explained that the development of an information system is of paramount importance to the future success of education. It is hoped that, among other things, the computer will relieve the teacher of many hours of clerical effort, making him more effective in providing individual and personal attention to each of his students.



## Elementary

Increased efforts are now underway in all parts of Canada to upgrade the qualifications of elementary school teachers. The Newfoundland Teachers' Association states that the greatest shortage of trained teachers is found in the primary grades, and the number of education students at university who apply for the primary education program is invariably lower than the number who apply for either the elementary or high school programs. Close to 70 per cent of Newfoundland teachers in 1963-64 had one year or less of education beyond the junior matriculation level.

The Canadian Teachers' Federation compiled 1963-64 statistics for all provinces in Canada, except New Brunswick and Quebec. While almost 75 per cent of all secondary school teachers possessed at least one university degree, less than 11 per cent of elementary school teachers were so qualified. The percentage of elementary school teachers in Ontario possessing at least one university degree was less than the average for all eight provinces, and only slightly exceeded 10 per cent. It has been recommended by responsible officials in Ontario that elementary teachers should be upgraded gradually to a minimum of four years' training after high school, and that by 1970 all persons entering the teaching profession should have a university degree. The Minister of Education predicts that the tendency to think of elementary, secondary, and higher education as completely separate components will soon begin to disappear.

The Provincial Association of Protestant Teachers of Quebec expects that holders of diplomas requiring only two years of training

will notice a decrease in the demand for their services, unless extra training has been acquired in an elementary level specialty. The Bachelor of Education degree is becoming increasingly popular in Quebec as a preparation for both elementary and secondary level positions. The Royal Commission of Enquiry on Education in Quebec would require that in future a Bachelor's degree would be necessary for teaching in the elementary schools.

The Alberta Teachers' Association reports the keenest demand for well-qualified elementary teachers, and this demand is most acute in urban centres. Each year a large number of immigrant teachers find employment in Alberta, most of them in elementary schools.

The requirement for specialist teachers in elementary schools in Ontario is also evident in the addition of primary school specialist certificate courses at the teachers' colleges in Hamilton and Ottawa during the 1966-67 academic year. Previously this course was available only at the Toronto Teachers' College.

The British Columbia Teachers' Federation reports that, despite the major expansion of educational facilities in the province, the total annual output of trained teachers continues to be only about 42 per cent of those who must be recruited annually to fill the needs of the expanding school system and the attrition of the teaching force. There continues to be a brisk demand for elementary school teachers, particularly those with university degree qualifications.

The Manitoba Teachers' Society reports that though the shortage of teachers is not quite as pronounced at the elementary level as it is at the secondary level, it nevertheless continues to exist. Former teachers may now be reluctant to return to the classroom because of the necessity of retraining due to the changed and changing elementary curricula. The result is that the pool of married elementary teachers may no longer be available to the same degree as in former years.

## Secondary

The establishment of additional junior and community colleges throughout the country continues to increase the demand for better qualified teachers, many of whom have been teaching at the secondary school level.

In addition there is a continuing need for

graduates in many specialized subject areas. The Manitoba Teachers' Society indicates that these areas include both academic and specialized fields such as physical education, guidance, commercial, home economics, and industrial. This need will probably continue for some time because of the now greater retaining power of the secondary school and the continuing emphasis and pressure upon all students to obtain more schooling. Coupled with this is the fact that about 40 per cent of Manitoba teachers at the secondary level do not possess the minimum requirements for their position.

The Alberta Teachers' Association states that well qualified and specialized secondary school teachers are needed and that shortages occur in most subject and service areas. The areas of most acute shortage appear to be teachers of girls' physical education, business education, French, and music, as well as librarians and school councillors.

The Ontario Secondary School Teachers' Federation says that Ontario faces another secondary school teacher shortage, and that this shortage would exist even if there was no change in workloads. However, Toronto boards are seriously considering a reduction in workload for teachers. This would place a further demand on the available supply.

Throughout the country there is a continued trend toward secondary school teachers possessing higher qualifications. Indicative of this is the report of the Chemical Education Subject Division of the Chemical Institute of Canada. This report recommends that persons who do not possess a degree should not be allowed to teach chemistry, and that ideally teachers should have an honours B.Sc. degree in chemistry. Furthermore universities might consider various means whereby teachers could work for the Master's degree by part-time study and research over a number of years. As well, universities should offer a graduate program leading to a Master's degree in education with a major in chemistry.

The Royal Commission of Enquiry on Education in Quebec has recommended that secondary school teachers in that province should all be university graduates and should have a specialization in their field of study. This recommendation has been endorsed by the Provincial Association of Protestant Teachers of Quebec. The Association reports

that the demand is particularly high for specialists in the service fields of guidance and remedial teaching and for librarians and audio-visual experts.

In the use of new technological methods, the Ontario Department of Education established two committees to develop courses of computer instruction. The data processing committee is defining a course for the secondary school commercial program, the first of which will be available during the 1966-67 academic year. The second committee is studying the impact of computers on the academic program, especially in mathematics and science.

### Tertiary

The third level of education, beyond secondary school, is the fastest growing segment of our educational system. Included in this sector of education are universities, colleges, technological institutes, teachers' colleges, and other institutions which provide education beyond secondary school.

Employment opportunities as teachers in this educational sector are rapidly increasing. The Canadian Association for Adult Education points out that this sector of education is a large and often unsuspected area of employment for people who do not care to be full-time teachers in the conventional sense. A much higher proportion of teachers in the tertiary sector of education have part-time teaching careers than is the case in the elementary and secondary schooling systems.

Employment opportunities at all educational levels are growing rapidly. At the university level, salaries have been increasing rapidly and Canadian teaching opportunities are becoming quite attractive to persons from other countries, in particular those from the United States. During 1965 and 1966 the Association of Universities and Colleges of Canada sent teams of representatives to the United States and the United Kingdom to talk with Canadian students studying in those countries regarding employment opportunities for teaching and research at Canadian universities. The results of these special team approaches are expected to lead to a more systematic method of advising Canadian students in other countries regarding teaching opportunities at home.

All phases of student personnel work and administrative work are developing rapidly

as institutions grow larger and as the variety of course offerings and work opportunities upon graduation become more varied. Institutions are providing an increased number of specialized programs of study which would qualify a person for such employment opportunities in the tertiary educational field.

A trend in the United States of recent years has been to develop a new Master of Philosophy degree which would involve courses of study comparable to a Doctor of Philosophy program, but which would not involve as extensive a research project. The intent here is to offer a program of study concerned primarily with qualifying and training university teachers. In Canada the University of Waterloo has established a Master of Philosophy program which requires as a prerequisite either an honours Bachelor's degree or the equivalent. The Dean of Graduate Studies at the University of Waterloo, in describing the program, said that rapidly-growing university enrolments indicate that Canada will soon need three times the present number of university teachers.

The trend in Canada by the provinces to establish community or junior colleges, or their equivalent, will increase markedly the requirement for teachers at the tertiary educational level. In the spring of 1966 the province of Quebec announced the official adoption of the Department of Education's recommendations regarding the creation of a series of institutes, as recommended by the Parent Report, to carry the load of pre-university and professional education beyond the public secondary school level. The Parent Report recommended that the teachers at these institutes should possess a Master's degree, or its equivalent, and should work under the direction of a number of teachers possessing Doctorates. Similar qualification levels have been proposed for junior colleges, or their equivalent, being established in other parts of the country. The Ontario Secondary School Teachers' Federation strongly recommends that teachers at the colleges of applied arts and technology, which are being established in Ontario, be required to undergo a course of teacher training designed especially for adult education.

The majority of teaching staff members at universities and colleges in Canada are still drawn from those who have qualified at the graduate level with Master's or

Doctor's degrees. For the past few years enrolments in the graduate schools of Canadian universities have been growing more rapidly than have undergraduate enrolments, and the rate of increase in graduate enrolments is continuing to accelerate. However, even with the rapid increases of those graduating with higher degrees, it will still be difficult to meet all of Canada's tertiary teaching requirements from Canadian graduate schools.

Many changes are taking place in the utilization of teaching staff at universities, and it is expected by some that this may enable universities to function effectively with fewer faculty members. In the fall of 1966 the new Henry F. Hall Building of Sir George Williams University came into use. This building was planned with the intention of using television, and every teaching room and laboratory is equipped with television receivers and with apparatus permitting the installation of television cameras. More than ten different television programs can be run simultaneously with the installation. The University of Manitoba has also experimented with lectures being given by closed circuit television, with the viewpoint that this may be part of the solution to a shortage of professors in future years.

The National Research Council surveyed the employment commitments of new science and engineering Doctorate graduates emerging from Canadian universities in 1965. Almost 50 per cent of those graduating, and committed to employment, were being absorbed by universities. Furthermore, almost 60 per cent of Canadian university students graduating from American universities were being absorbed by the universities. There was a net gain to Canada in this field since a larger number of non-Canadians, receiving Doctoral degrees from Canadian universities, decided to remain in Canada than the number of Canadians who were leaving the country.

The National Research Council reported that the average starting salary for those graduating with Ph.D. degrees from Canadian universities, and obtaining employment in Canada, was \$7,956 for those obtaining employment with universities, \$8,057 for those obtaining employment with the federal government, \$9,327 for those obtaining employment with industry, and \$7,988 for those obtaining other types of employment.



## ENGINEERING and APPLIED SCIENCES

THE nature of the engineering profession and the role of the engineer in the expanding technological world has radically changed since 1945. Because of this it has been estimated that qualifications of a recent graduate exceed those of the graduate of five to 10 years ago. This changing process in the engineering field has created a multitude of problems. The Director of Special Services of the Association of Professional Engineers of the Province of Ontario suggests that the talents of recent graduates have not been properly utilized because of the outmoded concepts of graduates of the past. His zeal is soon quelled and in five or 10 years his educational background in engineering becomes minimized by the rapid changes in technology. Thus the engineer soon is travelling down the path to obsolescence.

The Director of Special Services urges engineers to evacuate a large area of technical activity which they have regarded for many years as their own personal property because it is now rightfully the property of engineering technicians. This succinctly draws the contrast between these two new roles: that of the professional engineer who is more and more becoming involved in research and experiment, and the engineering technician who carries out the duties as set out in theory by the professional.

It is evident that this problem has beset the industry with a multitude of ills with the new aspiring engineers being improperly employed because of this widening of a seemingly limitless horizon. To help alleviate this situation, growing co-operation between government, industry, and the universities is devel-

oping. An integral part of this co-operation is in the field of education. For the engineer to be constantly up to date with recent changes, it is necessary to be involved in reading as much available material as possible. Another most important step is attendance at graduate courses at the universities either for the purpose of pursuing a degree or as refresher courses. In this area graduate schools and the extension departments of various universities have an important role to play.

The Co-ordinator of Business and Professional courses of the Extension Department of the University of Toronto reports that there is a total of 4,000 extension students at that university. Approximately 800 are in the engineering or related fields. The department stresses all facets of business and its growth, but in the last few years increased emphasis has been placed on the engineering area. For the professional engineer desirous of remaining attuned to the latest developments, further education, whether by graduate work or through extension studies, is the main spring-board to meet this fulfillment.

University officials are anxious to provide facilities for these engineers. The Acting Dean of the School of Graduate Studies of the University of Toronto speculates that the graduate school has a direct role to play, and an example is the establishment of a new degree oriented to the practising professional engineer. It is also hoped that those returning to study will be able to spend at least four months or more full time at the university. This entails the employer giving staff leave with pay in order to continue their studies. However, the employer must provide more than remunerative benefits. It is widely thought that the individual engineer's interest in taking courses to advance his knowledge frontiers will depend significantly upon the extent to which he is challenged by his assignment. If he is in a position in which his imagination will be sufficiently stirred, this may supply the necessary initiative to continue his studies.

A serious problem also exists within the universities as to sufficiently qualified professors to teach engineering. The General Secretary of the Engineering Institute of Canada comments that many universities find it somewhat difficult to recruit the necessary professors. Most of the universities request that their professors hold at least a Master's degree, and are more interested in a Ph.D. degree. They very often offer the possibility



of working toward the Ph.D. while the engineer acts as a lecturer, an associate professor, or a professor. The salaries offered by universities to professors have increased considerably and it should not be difficult for the universities to find suitable candidates.

The Dean of Engineering of the University of Waterloo has pointed out the almost startling evolution in engineering. He relates that in contrast to the past, many present undergraduate courses in engineering have tended to become almost indistinguishable from courses in science. The Dean notes that the essence of engineering is synthesis rather than analysis. To contrast the scientist and engineer, the Dean alludes to the late Theodore V. Karnan who once noted that scientists seek to understand what is and engineers seek to do what has not been done before. In addition to this role, the engineer in modern industry is becoming more intricately involved in management.

It is evident that the image and role of the engineer is rapidly growing from month to month. Engineers, like nearly all other professionals, must remain in a constant state of initiation and learning. Graduation from university can no longer be considered the end of the learning process. Instead it is the springboard to practical on-the-job training that, coupled with graduate courses, will keep the engineer abreast of current events.

## Chemical Engineering

The Chemical Institute of Canada predicts a 25 per cent increase in chemical engineering graduates in 1967, compared to an increase of just under nine per cent in 1966. The Institute suggests as well that the trend toward graduate work in the field is increasing and that nearly a third of current chemical engineering graduates are seeking a Master's degree or higher. This is in marked contrast to the situation only a few years ago when less than 10 per cent of the chemical engineering graduates were taking graduate studies. The full Bachelor's degree course in chemical engineering is now offered at 16 universities in Canada, and graduate work is available at the majority of these institutions.

Most chemical engineers are employed in the provinces of Ontario and Quebec. However, rapid development in the industries to be found in other parts of Canada has resulted in opportunities for chemical engineers in every province.

The Chemical Institute suggests that there is some evidence that Canadian industry is attracting an increasing number of technical men, including chemists and chemical engineers, from the United States. This may be due in part to the increased specialization of work available in industry, a situation which is being encouraged by the various federal government aids to industrial research and development.

The number of industries that employ men with chemical engineering training is growing constantly, and prospects for graduates are good. The University of British Columbia reports that employment opportunities for their graduating chemical engineers continue to be excellent. Most graduates find employment in the chemical process industries or the resource extractive industries. Graduate work is necessary for most research positions and is also a prerequisite for those wishing to teach at the university level.

The University of British Columbia is of the opinion that industry attracts almost the whole of its graduating class each year, and that under present circumstances, immediate entry into graduate work has little attraction for the majority of British Columbia graduates. Only a few Doctorates in chemical engineering are awarded each year in relationship to the Master's degrees awarded during preceding years. However, it is felt that these statistics are misleading since a number of chemical engineers with Master's degrees are awarded a Doctorate in chemistry rather than chemical engineering. If one looks at the graduations in chemistry at the Ph.D. level, it will be found that substantially more graduate each year than are awarded Master's degrees during preceding years.

Starting salaries for graduating chemical engineers continue to rise and are considered to be among the highest in the engineering fields.

## Civil Engineering

The problems of the civil engineer in the next fifty years will likely be in the areas of urban development, transportation, water supply, energy, waste reclamation, and recreational facilities.

The general training which the civil engineer receives permits him to enter into any one of the many specialized fields open to him. A substantial number of civil engineers enter construction and consulting firms and

various government agencies. Civil engineers may also find employment in such diverse fields as the pulp and paper industry, petroleum industry, and the utilities field.

More emphasis is now being placed on graduate work in civil engineering with the Doctor's degree being the requirement for teaching at the university level. There were 343 students enrolled in the Master's program in civil engineering in 1965-66, while 88 were studying at the Doctoral level. The increase in graduations at the Bachelor's level in 1967 is expected to be in the area of 10 per cent, compared to a nine per cent increase the previous year.

A structural engineering research laboratory to provide much needed facilities for research in the field of structures was opened at the University of Alberta in 1965. This new laboratory has made possible a program of study in structures leading to the degree of Doctor of Philosophy in civil engineering.

The Association of Consulting Engineers of Canada reports that of an approximate total of 46,000 professional engineers and graduate engineers-in-training an estimated 10 per cent or approximately 4,600 work in consulting engineering firms.

Consulting firms are involved in almost every type of engineering taught in universities, such as highways and bridges, hydroelectric and electrical engineering, water supply and waste disposal, structural and mechanical, forestry, pulp and paper, mining, municipal engineering, flood control, town planning, atomic energy, communications, and many others.

Canadian consulting firms are active in many parts of the world, including India, Africa, the Middle East, Central and South America, Spain, and Mexico.

## **Electrical Engineering**

Graduates in electrical engineering are still very much in demand in Canada and should have no difficulty in finding suitable employment.

There is now a constant demand for electrical engineers in the electronic computing devices field. However, a variety of employment opportunities are available to electrical engineering graduates, including work in the electrical design and manufacturing fields,

and in the various areas of transportation, communication, and public utilities. While a number of graduates enter the federal government service or government agencies, the majority find employment within industry.

Most Canadian universities offer courses of study in electrical engineering, and sixteen offer graduate study in the field. There is expected to be a 20 per cent increase in the number of electrical engineering graduates in 1967, compared to a six per cent increase experienced in 1966 and 10 per cent in 1965. This continues the trend to increased graduations which has prevailed since 1964.

Starting salaries for graduates in electrical engineering are comparable to those in the other engineering fields and have shown a small increase over the 1965 figures.

## **Engineering Physics**

The number of students graduating in engineering physics will be slightly larger in 1966 than was the case in 1965, reversing the trend toward smaller graduating classes. However, the 1966 graduating class will still be smaller than that of 1964, the difference amounting to 10 per cent.

Engineering physicists are generally employed to do fundamental research or development work toward the solution of a specific problem. Various governmental and industrial laboratories hire engineering physicists for pure and applied engineering research, and, in industry, graduates are necessary for development and production line work in the manufacture of highly technical products.

The solid background obtained in physics makes graduates from the engineering physics courses ideally suited to careers as geophysicists and meteorologists or meteorological officers. Various governmental agencies are the major employers of graduates looking to meteorology as a career, with the Meteorological Service of Canada employing the greatest number.

Graduates in engineering physics can look to salaries considered to be among the highest in the engineering field. An increase of close to 10 per cent was observed for 1966 graduates compared with salaries offered to those graduating in 1965.

## **Geology and Geological Engineering**

The Geological Association of Canada reports that the number of graduates in honours geology and engineering geology in 1967 will be comparable to 1966 with increasing competition for their services between industry, government, and the academic fields.

The Association suggests that the tendency for many graduates to continue their research in areas not applicable to mineral exploration work and the opportunities available to qualified students for graduate studies at the universities considerably limits the number entering the industrial field. Similarly, with the introduction of an earth science curriculum at the high school level, many geologists are entering the teaching profession, and graduate students are continuing their studies in preparation for teaching responsibilities. Although this will have long-term benefits, the shortage over the short term will be acute.

An increasing number of foreign graduates as well as experienced geologists are immigrating to Canada to gain experience in this field and to take advantage of the present employment opportunities. The Geological Association contends that this will serve to alleviate the present shortage, but notes that the competition for their services between government and industry is now apparent.

The Geological Survey of Canada is unable to obtain sufficient geologists and summer assistants to staff its regular summer programs and must recruit some non-Canadian college students at the graduate level for this purpose. As well, private companies are having increasing difficulty finding qualified geologists for their exploration programs.

Geologists with graduate training and summer experience are most in demand, as recruiting emphasis is increasingly directed to those who possess advanced degrees. About one half of geologists in Canada now possess higher degrees.

Salaries for graduates in geology and geological engineering are higher than those for most other comparative disciplines and average about \$505 per month for those with Bachelor degrees in geology. Geological engineering graduates receive about \$30 more per month than do those with geology degrees.

## **Geophysics and Geophysical Engineering**

The majority of graduates in honours geophysics or geophysical engineering proceed to graduate work, thereby enhancing their opportunities for highly remunerative employment. This tendency of many geophysicists to remain on at university, to continue research in areas not applicable to mineral explorations work, or to prepare themselves for teaching responsibilities has definite long-term benefits for the student, but results in an even greater shortage of geophysicists available for employment in mineral exploration.

The Canadian Institute of Mining and Metallurgy noted last year that the slight increase in the number of honours geophysics graduates seen in 1966 was not sufficient to meet the increasing demand for graduates in this field. An increase of the order of 10 per cent is anticipated for 1967.

Geophysical methods of exploration are being increasingly employed by exploration companies as an aid to mapping and in an attempt to locate buried and drift-covered deposits. There also seems to be a continuing demand for geophysicists to undertake foreign assignments under the various Canadian and United Nations foreign aid programs.

## **Industrial Engineering**

The Dean of Applied Science at the University of Windsor reports that the demand for industrial engineers in Canada today is more than 10 per cent above the supply. The Guidance Centre of the Ontario College of Education suggests that the increasing complexity of industrial operations along with the expansion of automated processes should result in a further increase in the demand for industrial engineers in the near future.

A third university — the University of Windsor — has joined those institutions offering a degree course in industrial engineering. The new program was first offered in September, 1966, to students who had completed their second year in mechanical engineering. The course of study will consist of training in psychology, sociology, business administration, and operations research, as well as in engineering subjects. Two other institutions now offer courses in industrial

engineering, the University of Toronto and the Nova Scotia Technical College. The course of study at the Nova Scotia Technical College stresses selling, work study, logic, accounting, applied psychology, and mathematics. To qualify for admittance, a student must have successfully completed three years of pre-engineering at a recognized university. The University of Toronto anticipates 35 graduates in 1967, while Nova Scotia looks to a first graduating class of 25 in 1967. The University of Toronto also had 45 students taking graduate work in industrial engineering during the 1965-66 academic year.

Many industrial engineers gain their training through graduate studies following undergraduate work in engineering, science, or mathematics. There are a fairly large number of universities both in Canada and in the United States that offer graduate courses which prepare the student for work in industrial engineering or operations research. Those in Canada include McGill, Queen's, Toronto, Western Ontario, and British Columbia.

The Head of the Mechanical Engineering Department at the University of Windsor suggests that industrial engineering draws upon specialized knowledge and skill in the mathematical, physical, and social sciences, together with the principles and methods of engineering analysis and design. The training obtained through courses offered in industrial engineering should prepare graduates to specify, predict, and evaluate the results to be obtained from new industrial systems designed for more efficient production and better satisfaction for the man on the job.

At present, the skills of the industrial engineer are used by large corporations through the permanent hiring of staff specialists, and by smaller companies through the engagement of consultants on the staff of data processing, accounting, and consulting firms. It is estimated that about a third of all graduating engineers eventually become involved in management.

### **Mechanical Engineering**

Close to twenty Canadian universities offer courses in mechanical engineering, ten of which offer studies leading to a Ph.D. degree in the field. The University of Windsor is the latest university to add Doctoral training to its course of study in mechanical engineering. The 1967 graduating class is expected

to be as much as 20 per cent higher than that of 1966, continuing the trend toward rapidly increasing sizes in graduating classes noted last year when there was a 25 per cent increase in the number graduating.

Mechanical engineering as a profession includes the design, manufacture, and operation of all classes of machinery, power plants, and manufacturing plants. Queen's University suggests that the training of a mechanical engineer must be broad enough to give the student a thorough knowledge of the fundamental principles and not merely specialized training in one of the many branches of the engineering profession.

The scope of mechanical engineering is so wide and its services so basic that graduates in this field of engineering are in demand in a large number and variety of Canadian industries. Thus, graduates should have little difficulty in finding employment in this field with its wide scope of opportunities. Manufacturing industries as well as power plants are among the variety of industries which require mechanical engineers.

Graduating mechanical engineers can look to somewhat higher starting salaries than can those emerging from other engineering disciplines.

### **Metallurgy and Metallurgical Engineering**

There are approximately 100 metallurgists graduating each year from Canadian universities. However, according to the Guidance Centre of the Ontario College of Education, the demand for these graduates far exceeds the supply, and most universities and industries have been seeking ways to increase the number of young men and women going into this profession in Canada.

The future of the Canadian metallurgical industry is extremely promising due for the most part to Canada's vast resources. Many Canadian companies now have research and development divisions and because of the broad training which the metallurgist receives, he plays an important part in new developments.

Because the metallurgist is responsible for the ultimate refining and use of the metals which are produced in Canada, the opportunities for employment that are open to the new graduate are almost innumerable. All

plants involved in the production of steel, aluminum, magnesium, nickel, lead, zinc, and copper are potential employers of the metallurgical graduate. As well, there are a large number of industrial concerns that use machinery or other metallic equipment and have sufficient problems relating to the use and maintenance of metals to justify employing a metallurgist.

The 1967 graduating class in metallurgy and metallurgical engineering is expected to be about 15 per cent larger than that of 1966.

Nine Canadian universities offer training in metallurgy and metallurgical engineering to the Ph.D. level. The Guidance Centre of the Ontario College of Education notes that about 30 per cent of all graduates continue on to graduate work at university and about 50 per cent are employed in research and development.

Starting salaries for metallurgical graduates remain among the highest offered to graduates of any of the engineering disciplines.

## Mining Engineering

Forty graduates emerged from Canada's eight mining engineering faculties in 1966, and approximately the same number is expected in 1967. The successively smaller graduating classes in mining engineering have produced some concern on the part of the Canadian Institute of Mining and Metallurgy. The Institute reports the launching of a very active program to attract potential candidates into the mineral industries. They further report that there appears to be no alleviation of the shortage of engineers and scientists to fill the needs of the mineral industry.

The University of Saskatchewan suggests that all universities offering mining engineering courses are constantly attempting to improve training, and are very conscious of the need to encourage student interest. Classes at some universities have been so persistently small that the departments of mining engineering at these universities are undergoing a period of great change. The Department of Mining Engineering at Saskatchewan reports that graduate study, to the Master's degree level, has now been established, and research in the field is in progress at that university. The University of British Columbia, Laval University, and Queen's

University are co-operating closely in the design of their courses of study in order that there might be a free exchange of staff and pupils in mining engineering. In 1965, a program was begun allowing each university to concentrate on graduate training for mineral engineers as well as research in about six special mining fields. Students and faculty are able to move freely among the three schools, but each student graduates from the university where he entered the program.

During the past year, McGill University expanded their graduate activities in mining engineering by offering both a diploma course and a course leading to a Master's degree. The latter will enlarge the scope of the subject matter covered into such fields as management, economics, and organization in mining operations, and offers a curriculum of practical experience that is integrated with academic studies covering operational and analytical aspects of mining, the earth sciences, geomechanics, and operations research.

The University of British Columbia has also made some changes during the past year and has expanded their courses in mining engineering and mineral dressing into a combined course of mineral engineering.

The Canadian Institute of Mining and Metallurgy reports that much progress has been made in recent years at several Canadian universities to make changes in the curricula for mining engineering students in order to take advantage of new concepts and ideas resulting from scientific and technological progress. Greater emphasis is being given the basic sciences and courses in mathematics, particularly in numerical analysis, that are so essential to computer applications.

Current graduates in mining engineering can look to a large number of job opportunities with few candidates to fill the available positions. The University of Saskatchewan reports that graduates are in demand for exploration, development, and production work in both the mining and the petroleum industry. Depending on their interests and ability, graduates may undertake supervisory, engineering, or research activities.

The Canadian Institute of Mining and Metallurgy is of the opinion that salaries paid candidates entering the mineral industry are the highest of any offered new graduates in Canada today.

## **Survey Engineering**

Graduates in surveying will find specialized employment in federal government survey agencies, and are in demand to meet the need for property surveyors, and for men to introduce advanced survey methods into the fields of highways, power development, and the mapping of natural resources.

The position of the university graduate wishing to qualify as a surveyor varies greatly from province to province. The Canadian Institute of Surveying reports that, depending on his degree, he will usually be exempted from most of the examinations in elementary mathematics and physics and also part of the period of articles. In post-war years, the reluctance of the professional associations to accord a greater measure of recognition to university qualifications acted as a serious deterrent to university graduates entering the profession. As a result, apart from Quebec land surveyors, a relatively small proportion of Canadian surveyors are university graduates.

The professional associations, however, have become concerned in recent years at the declining number of university graduates entering the profession. The sharp increase in university enrolment has correspondingly reduced the numbers of suitable non-university people available to enter the profession. This has occurred at a time when the technical skills required of a surveyor appear to be growing ever more demanding under the pressure of new techniques, equipment, and methods.

In 1960, as a direct result of a colloquium on survey education sponsored by the Canadian Institute of Surveying, the University of New Brunswick started a five-year degree course in survey engineering. A Doctor's degree in survey engineering is offered by New Brunswick, while Doctorates in geodesy and surveying are offered by Laval University.



The number of graduations of survey engineers from Canadian universities has increased from a total of 28 during the 1959-61 period to 71 during the 1962-64 period.

## **FINE ARTS**

SCHOOLS and/or departments of fine art exist in nine Canadian universities — Alberta, British Columbia, Dalhousie, Manitoba, McMaster, McGill, Mount Allison, Toronto, and Sir George Williams. Five of these universities — Alberta (Edmonton), Dalhousie, Manitoba, Sir George Williams, and Mount Allison — offer the Bachelor of Fine Arts degree, while the remainder offer the Bachelor of Arts degrees in Fine Art.

The universities of British Columbia and Toronto now offer a Master's degree in fine arts, and the latter reports that a Ph.D. program is in the planning stage.

The Chairman of the Department of Fine Arts at Toronto suggests that until very recently the B.A. was the normal terminal degree for most students seeking employment, but that there is now a partial replacement of this degree by the M.A. as a requirement. It is quite apparent, he reports, that this trend will continue.

The University of Toronto points out that about one third of its fine arts graduates become high school teachers, a third work in galleries and museums, and the remainder go into libraries or do publicity work. The increase in the number of museums and the raising of the professional standards of their staff will ensure a continuing demand for Master's degrees in the history of art. The Head of the Fine Arts Department at the University of British Columbia reports that British Columbia and the University of Toronto are the only Canadian universities offering both the B.A. and M.A. in the history of art. This means, he suggests, that there are only two universities in Canada that can supply the personnel required for art gallery work, ranging from director and curator, through docent, education officer, and display technician, to public relations officer and business administrator. The number of galleries in existence in Canada in 1945 will have multiplied ten-fold by 1970.

Graduates in art history also find employment as art historians and as art critics. As well, the inauguration of an art program to



Grade 13 in Ontario and the important role the history of art now shares in this program is making a heavy demand on the supply of secondary school art teachers.

For the most part, the universities which offer the B.F.A. degree intend the course to develop creative ability in drawing, painting, sculpture, or the graphic arts. Graduates of the B.F.A. course of study primarily practice their art as artists or designers. A four-year diploma course given at the University of Manitoba lists no admission requirements and is intended primarily for education in art on a vocational level, to train the student as a practising artist.

The Chairman of the Fine Art Department at Toronto states that salaries for teachers of art are the same as for other specialists, while those for museum personnel are gradually rising though are not as yet competitive with those of comparable professions.

## **FORESTRY and FORESTRY ENGINEERING**

THE unprecedented expansion of the wood-using industries in Canada has caused a sharp increase in demand for both graduates and those with graduate training in forestry. The Canadian Institute of Forestry reports that the commercial aspects of this expansion have increased the demand for men qualified in the engineering and supervision of the harvesting and transportation aspects of wood utilization. A conservative estimate, made by the Institute, suggests that at least twice as many graduates could have been placed as received Bachelor's degrees in 1966.

The Dean of the Faculty of Forestry at the University of New Brunswick notes that the demand for U.N.B. graduates continues to be very strong, with many employers either left with their needs unfilled or forced to turn elsewhere for possible alternatives to a university-trained forester. However, the university also reports that the supply of well-qualified and suitable applicants in their first and second years remains below a desirable level. Nevertheless, the university reported a graduating class in 1966 of 43, with an anticipated 31 graduates in 1967.

Four Canadian universities — Toronto, British Columbia, Laval, and New Brunswick — offer courses in forestry and forestry engineering. The University of New Brunswick

and the University of Toronto both offer studies leading to the Master's degree in forestry. As well, the University of Toronto gives a one-year diploma course, following the Bachelor's degree, in resource management. This is available to graduates in agriculture, biology, forestry, geography, and related sciences, and is intended to bring together the various parts of zoological and forestry information that relate directly to the management of the renewable natural resources. Laval University offers the Ph.D. degree in forestry, while the University of British Columbia offers the Ph.D. in fields concerned with the basic scientific or economic aspects of forestry and forest products.

The Faculty of Forestry at the University of British Columbia will move into a new building in late 1966 and hopes to greatly increase its staff and to add to its graduate program to meet the rapidly growing needs for research in forestry and the wood sciences.

The four institutions predict a total graduating class in 1967 of about 125 which is approximately the same number as graduated in 1966.

The management of the forest land for the production of forest products, especially wood products, is the essential core of the forester's responsibilities. In this area, expansion takes place largely in response to increased utilization of the products of the forest. The expansion in wood utilization is developing an increase in demand for forest managers which will undoubtedly grow rapidly in the next few years. The Canadian Institute of Forestry states that openings are now available in this area which are not being filled.

The increased use of the forest for recreational use and the expanding activities of A.R.D.A. are providing new opportunities for professional foresters. The basic forestry training with its emphasis on the biological and managerial aspects of forest control and development and the inclusion of social sciences in his training makes the forester well suited to undertake responsibilities in these areas of forest use.

A good deal of research and experimentation is required to provide the necessary background of basic information and to develop the techniques for the effective and efficient handling of the forest. The Institute of Forestry reports that the federal government



and certain provincial governments are involved in research, and tremendous expansion is visualized in this area. At the present time, it may be said that openings are available for at least four times as many research graduates, in virtually all fields of forestry, as there are qualified individuals available. Individuals expecting to specialize in a field of forestry or forest science should prepare themselves by study toward the Master's or Doctor's degree in their field of interest.

The University of New Brunswick notes a sharp rise in starting salaries for forest scientists, as high as \$550 for members of the 1966 graduating class.

## GEOGRAPHY

SEVENTEEN Canadian universities offer honours or major programs in geography, while nineteen universities hold summer schools or summer sessions at which geography can be taken. In addition, seventeen of these universities also offer extension or evening courses in geography.

The Canadian Association of Geographers notes that in 1965-66 there were 480 students registered for Bachelor's degrees with honours in geography in Canadian universities compared with 400 last year. In addition, there were 260 students registered in programs leading to a major in geography. Of this total of 740 students with a concentration in geography, 240 were expected to graduate in 1966.

The number of students obtaining a higher degree in geography in 1966 will be approximately 30 per cent greater in 1965. There were 230 students registered in the Master's program, 140 for the maîtrise and licence, and 80 for the Doctorate. In 1965, 50 Master's degrees (including the maîtrise) were conferred and six graduate students received the Doctor's degree.

An examination by the Association of Geographers of the topics chosen for research by graduate students shows that geomorphology and urban geography are receiving the most attention at the present time, with studies of industrial activities and agricultural geography ranking next in importance.

Honours graduates in geography usually find employment in secondary schools, especially in those provinces where account is taken of the specialist qualification and the teacher has the opportunity to build up his

own department. Graduates with higher degrees should experience no difficulty in obtaining employment. A recent survey indicates that there are more than 30 positions for professional geographers in universities and government departments which are unfilled because of the lack of suitably qualified candidates.

Studies in land use are developing rapidly in view of the increased attention being paid to this special field. The Director of the Institute of Land Use at Brock University reports urgent needs for personnel by federal and provincial governments as well as by private consulting firms active in land use planning.

Salaries in the universities and the federal civil service are comparable to those paid to graduates in other fields. However, according to the Canadian Association of Geographers, some provincial governments have not yet established geographers on the same scale as other scientific personnel, and salaries tend to be slightly lower in that area of employment.

## HISTORY

THE Chairman of the History Department at Carleton University states that the majority of university graduates in history evidently enter the teaching profession. Some of them become primary school teachers, to work toward the B.A. in history by part-time study after the commencement of their employment as teachers. Most of the students who proceed by full-time study to the Bachelor's degree in history and then to a teaching career become secondary school teachers. They may do so with a pass degree in the subject, but there is an advantage from the standpoint of status and salary in having an honours degree, which usually requires four years of study and the maintenance of at least a second-class standing in history courses.

Canadian universities graduated some 390 honours history students in 1966, with an increase of up to 12 per cent forecast for 1967. The Association of Universities and Colleges of Canada, in co-operation with the Dominion Bureau of Statistics, states that 15 Ph.D. degrees in history were granted in 1964 compared to 28 in 1965, representing an increase of close to 100 per cent.

The Master's degree in history is an avenue to teaching at the secondary school and uni-

versity levels. However, the university teacher who holds such a degree is increasingly expected to be studying for the Ph.D. degree in his area of specialization.

The Canadian Historical Association notes that a number of historians are employed in government service at both the federal and provincial levels. Those who hold the honours or the Master's degree are in a favourable position to qualify for employment in the Department of External Affairs and in the Public Archives of Canada or the various provincial archives.

The graduate in history is eligible for certain other occupations since he has normally taken courses beyond his specialty and since history itself is a wide-reaching subject. Accordingly he is accepted for professional training in areas where such a liberal education is considered to be a prerequisite. Graduates in history, then, often pursue further studies with a view to becoming clergymen, lawyers, librarians, or journalists. A few of the larger organizations in Canada employ historians to keep accurate records of their particular histories.

Most Canadian universities offer a Master's degree program in history, while about twenty institutions offer a program at the Doctorate level. The fields of study range through the areas of Canadian, American, European, and Asian history. The present world situation has created a growing interest in Chinese and Russian history, and the major universities in Canada who offer these courses note an increasing number of students specializing in these particular fields of history. The University of Toronto's School of Graduate Studies offers a Doctor's degree program in Asian history, while the University of Alberta at Edmonton offers the Master's degree in East Asian history. A Master's degree in Asian studies is given by the University of British Columbia, Faculty of Graduate Studies. This latter area of study includes the languages and literature as well as the histories of countries such as China, Japan, and India.

## HOME ECONOMICS

THE Canadian Home Economics Association suggests that the horizons for home economists are constantly broadening, and that the demand for graduates in home economics continues to exceed the supply. The Associa-

tion divides the field of work for home economists into six broad groupings — education, governmental service, business, social and welfare agencies, research, and dietetics.

There is a shortage of home economics graduates for teaching positions in nearly every province and at every level including nursery school, junior high school, secondary school, and university. Graduates are now being called upon to teach in technical and trade schools, particularly in training courses for the food service industry. A one-year course in education following the Bachelor of Home Economics degree is necessary in most provinces to qualify as a specialist.

The Dean of the College of Home Economics at the University of Saskatchewan notes that home economists are required in adult education. They are employed by federal government departments such as the Department of Agriculture (Consumer Section), the Department of Health and Welfare, and the Department of Fisheries. Extension specialists, district home economists, and 4-H supervisors are required in almost every part of Canada, and as well provincial health departments employ public health nutritionists. In the developing countries and in the Canadian anti-poverty projects, home economists are needed who are specialists in family finance, nutrition, and management as well as being experts in textiles, equipment, and the homemaking skills.

A pamphlet on home economists produced by the University of Manitoba states that home economists in the business field are directly employed or consulted by manufacturers of food, furnishing, clothing, and textiles; by department stores, advertising agencies, magazines, newspapers, television, and radio. In public relations work with companies processing food or manufacturing food products, home economists answer questions from consumers and assist with advertising programs.

A small number of interesting business careers are available to graduates in the clothing and textiles field. Textile firms in Eastern Canada employ home economists to carry on education in textiles for consumers and sales people and to participate in their testing and research programs.

Sixteen Canadian universities and colleges offer a degree in home economics. These institutions graduated almost 450 home

economists in 1966 and anticipate somewhat more than 500 graduates in 1967. This is about the same increase in numbers as took place the previous year when one compares the size of the 1966 graduating class with that of 1965. A Master's degree can be obtained at the universities of Alberta and Manitoba, while the University of Toronto offers a Master's degree in food science. Courses and research work leading to the Master's and Doctor's degrees in certain areas of foods and nutrition, home management, or textiles, clothing, and design are available at Macdonald Institute of the University of Guelph. Testing and research work is the general area of employment by most students with graduate degrees.



Starting salaries for graduates in home economics in 1966 were substantially higher than those of the last few years.

## Dietetics

The Director of Dietary Service of the Queen Mary Veterans Hospital, Montreal, reports that there are more job opportunities on the labour market for dietitians than there are personnel available. The shortage of qualified candidates for vacant positions has required the profession to turn more frequently to male dietitians, who, according to the Director, are considered more than suitable, particularly for certain administrative jobs.

The opportunities for employment of dietitians are numerous. The Quebec Dietetic Association observes that approximately 62 per cent of Canada's dietitians administer the hospital food services, control budgets, prepare menus, supervise the purchase of food and equipment, and direct and train person-

nel. Many, in addition, teach nutrition to patients, nurses, and other personnel. Others become involved in medical research. About 11 per cent administer collective food services in schools, banks, plants, large companies, and restaurants. Another eight per cent are engaged in research and publicity for food-product companies. This work involves the preparation of posters and the writing of publicity texts to be distributed through the various news media. Seven per cent are employed as nutritionists for private or government agencies, clinics, health services, and social welfare services. The remaining number take part in the preparation of plans for the installation of food services.

According to the Director of the School of Home Economics at the University of Manitoba, professional qualifications in dietetics include a degree in home economics or food sciences from a university where the course content meets the requirements of the Canadian Dietetic Association, plus a year of internship taken as a post-graduate course or as three phases, the first two of which may be completed during the summers following second and third year. Membership in the Canadian Dietetic Association is based on completion of requirements as set down by the respective provincial associations.

It is possible to continue studies toward a Master's or Doctor's degree in a number of the different areas of employment.

The Quebec Dietetic Association suggests that starting salaries for dietitians vary according to experience and the responsibilities involved but are comparable to those of other professions requiring similar academic preparation.



## HOSPITAL ADMINISTRATION

THE number of positions for hospital administrators is increasing in Canada not only because of the growing realization of the need for specially-trained persons to fill these positions, but also because of the growth in the number of public general hospitals. The Ontario College of Education's Guidance Centre observes that this increase has amounted to nearly 60 per cent in the last ten years.

The need for special training came to be recognized as hospital administration became more demanding, and there are now in Canada three universities which offer degrees or diplomas in hospital administration — Toronto, Montreal, and Ottawa. The University of Montreal is the only one to offer courses in the French language, the Director of that university's Graduate Institute of Hospital Administration reports. The entrance requirement to any of these schools is a degree in arts, medicine, or the sciences. The Head of the Department of Hospital Administration at the University of Toronto notes that all courses consist of nine months' academic work followed by a one-year residency in an acceptable hospital in either Canada or the United States. The Director of the School of Hospital Administration at the University of Ottawa reports that the three schools graduated a total of 30 hospital administrators in 1966 and will probably produce another 40 in 1967.

In addition, three other avenues are open to those interested in qualifying as hospital administrators. Both the Canadian Hospital Association and the College of Commerce, University of Saskatchewan, offer two-year correspondence courses, while the University of Montreal, through its Extension Department, offers in French a series of nine courses bearing on hospital administration.

A hospital administrator co-ordinates and directs, in accordance with the policy of the governing board of the hospital, all its activities. He is the representative of the board to the patients, the medical staff, and the employees of the hospital.

Hospital administrators are employed in general and special hospitals and in other patient-care institutions. A small number of hospital administration graduates obtain em-

ployment with federal and provincial governments, hospital associations, management consulting firms, and other health care organizations.

Young graduates will generally find that their first position will be that of assistant administrator until maturity and experience have been obtained. The chief prospect for advancement is to a larger or more challenging position, particularly in such related fields as public health administration, hospital insurance administration, or public health education.

Starting salaries vary considerably depending upon the size and locality of the hospital and the administrator's basic qualifications. Administrators with degrees in medicine are likely to receive higher salaries than others.

## INTERIOR DESIGN

THE University of Manitoba is the only Canadian university offering a degree in interior design, but the student body is drawn from all parts of the country, and graduates spread right across Canada, being located in all major cities from Halifax to Vancouver.

The University of Manitoba anticipates a total of 17 graduates in 1967, a rise of three over the figures for 1966. The growing interest in the field of interior design is reflected in the expected 50 graduates for 1968.

The majority of graduates in interior design are drawn into the commercial field. They are employed by architects; on the staff of interior design firms or interior studios of department stores; in the planning departments of stores or hotels chains; in office planning and supply; in contract sales departments, and with restaurant suppliers. A limited number of graduates enter the teaching profession in the specialized fields of high school art and university applied arts departments.

The field is open to both men and women, and professional organizations exist in Quebec, Ontario, Manitoba, Alberta, and British Columbia.

The Head of the Department of Interior Design at the University of Manitoba suggests that the average starting salary for 1966 graduates would be about \$380.

Two Canadian universities offer courses leading to the Bachelor of Journalism degree — Carleton and Western Ontario. A one-year graduate course in journalism is also available at Carleton to holders of a Bachelor's degree in arts, science, or commerce.

Loyola College is now offering a B.A. degree with a major in communication arts in its new Communication Arts Department. The courses do not deal with the technical aspects of communication but with the possibilities, scope, and responsibilities that the tools of mass media communication have in all fields and especially in education. The new courses are aimed at students who wish to become writers, performers, critics, or teachers, and at those heading for careers in public relations, promotion, or advertising. This year 50 students are majoring in communication and 14 are taking the courses as options. Courses in cinema, drama, radio, and television will be added to the curriculum over the next two years.

Worthy of mention to students interested in freelance careers is the B.A. degree course in creative writing offered at the University of British Columbia. Through this course, special instruction is given to students on the writing of radio, TV, and stage plays and of novels, short stories, and poetry.

Journalism graduates can take advantage of a wide variety of opportunities for employment with perhaps the most popular being the field of newspaper writing, though the salaries offered in this area are generally slightly lower than in other areas of journalistic endeavour. Journalists may also find employment as reporters and news editors with radio and television, as information and public relations officers in business and industry, and as writers and editors with the various popular Canadian magazines and periodicals. The operation of information, editorial, and public relations divisions within each department of the federal government means a demand each year for a number of journalism graduates.

Starting salaries for journalism graduates are similar to those offered to graduates in mass arts but vary considerably with the numerous areas of journalism.

THE Dean of Law at the University of Saskatchewan reports a serious shortage of top students entering law and suggests that this shortage accounts for the sad neglect in Canada of legal research.

The Canadian Bar Association reports too of a shortage of able, experienced lawyers and suggests that opportunities exist in the field of litigation for anyone who has an aptitude for this kind of work and is prepared to devote the time and effort required to obtain the necessary experience. The Faculty of Law at the University of British Columbia notes that there has recently been a substantially greater demand for young lawyers and articled students than that law faculty can provide.

The Association further observes that the number of lawyers being called to the Bar each year is increasing and that this trend is expected to last for a number of years. A 17 per cent increase in the number of law school graduates is predicted for 1967.

Some lawyers devote themselves exclusively to specialization in one facet of the law such as corporation law, tax law, patent law, or labour law. This specialization, however, is more evident in the larger centres, for rural area lawyers must usually conduct a more general type of practice. The Law Society of British Columbia, on the other hand, observes that there are extremely few lawyers outside of corporate positions who can confine themselves exclusively to one type of work. Those who may be said to specialize have simply concentrated on a particular aspect of the law and in this fashion have become expert without completely withdrawing from the other fields, the Society reports.

Lawyers may find employment in the law departments of industrial and mercantile companies as well as with governmental agencies and departments where the complexity of the problems facing government and industry make it particularly desirable that the legal implications of any proposed action be properly understood.

The Canadian Bar Association suggests that no increase is indicated in the number doing graduate work among those who intend to engage in private practice.



In fact, the Law Society of British Columbia observes that graduate study is almost never pursued by the practitioner and is not generally recommended for him by the academic authorities. However, the Canadian Bar Association does point out that the growing number of law teachers now required in Canada is boosting the number of students engaged in graduate work.

Qualification as a lawyer in one province in Canada does not qualify a person for practice in any other province, although the governing bodies of the profession in the common law provinces have adopted fairly uniform standards of admission from one province to another. Quebec, governed provincially under civil law, does not conform in detail to these uniform standards. Admittance to the practice of law in Canada is usually granted following two or three years of university pre-legal education, a Bachelor of Laws degree from a Canadian law faculty, and a period under articles of clerkship with a practising member of the profession.

During 1965 it was announced that, commencing in 1968, Osgoode Hall Law School would become associated with York University as its Faculty of Law, thereby bringing to a close a long period during which Osgoode Hall Law School has been maintained and operated by the Law Society of Upper Canada.

As well, the University of Manitoba announced that its law school, which is at present under the auspices of the University and the Law Society of Manitoba, will become a full faculty of the University. The University of Windsor is presently considering the possibility of establishing a law school on its campus. There are now 15 universities which offer the study of law to prospective students.



## LIBRARY SCIENCE

THE Assistant Director of the McGill University Graduate School of Library Science reports a tremendous need for librarians in Canada. Estimates of the current demand for professional librarians range from 600 vacancies, noted by the Canadian Library Association in 1965, to potential demand figures, based on standards for various types of libraries, showing a balance of 18,850 required as of early 1966.

A survey of library education conducted by the Dominion Bureau of Statistics suggests that long-range planning for the development of library education should include realistic assessment of library needs and the assignment of priorities to the training of professional staff for those types of libraries where the need is greatest. As well, centralized technical services, computerized catalogues, subject bibliographies, and other aids to efficiency can release more professional librarians for direct service to the public. The Assistant Director of McGill's Library School feels that there is a need for a short librarian's course which would train people for non-administrative work and thus free advanced graduates for top positions.

Canada has five professional library schools — at McGill University, and at the universities of Montreal, Ottawa, Toronto, and British Columbia. Of these five, McGill, Ottawa, and Toronto offer courses leading to a Master of Library Science degree. A report sponsored by the Committee of Presidents of Provincially-Assisted Universities and Colleges of Ontario states that it is not too early to consider the possibility of establishing within a few years a Doctoral program in librarianship in Ontario. The basic qualifications for the professional librarian is a Bachelor's degree in arts or science plus one full year of library training leading to a B.L.S. at one of the five library schools.

The number of library science graduates with Bachelor's degrees is expected to reach a total of approximately 400 in 1967, about 50 more than were graduated from the five schools in 1966. In addition the number graduating with Master of Library Science degrees is expected to double to almost 70.

McGill University has only recently eliminated the one-year course leading to a Bachelor of Library Science degree, and now offers only a two-year Master's course. Some

90 students were enrolled in McGill's Master's course in 1966, and the completion of an extension to its Redpath Library in 1968 is expected to expand the capacity of the school to 200 students.

A new library school for the Edmonton campus of the University of Alberta has been approved by the Board of Governors of that institution, and it is hoped that a dean and staff will be appointed in time to commence operations in 1967. As well, the Ontario Minister of Education announced in 1965 that a new library school would be established at the University of Western Ontario.

Recent developments in the fields of automation and data processing furnish special opportunities in librarianship to students with a background in mathematics, logic, semantics, or linguistics, according to the University of Toronto. Special emphasis will be given to the study of automated procedures and communications links in an examination of means of co-operation among Ontario's academic libraries. This examination is to be carried out by a Committee on the Co-ordination of Library Services in Ontario set up by the Committee of Presidents of Provincially-assisted Universities of Ontario. The librarian and one member of the academic staff of each of the provincially-assisted universities will sit on the Committee. In line with the recent interest in automation in libraries, the libraries of the University of Toronto and the University of Waterloo have plans to exchange information about new books catalogued by means of an electronic data processing system.

There are many areas of specialization within the profession itself. They include: reference librarians, who are experts in finding information and answering questions; cataloguers and classifiers, who are responsible for cataloguing and classifying books so that related information will be kept together on the shelves; circulation librarians, children's and young people's librarians; regional and county librarians; school and university librarians, and special librarians who serve the particular needs of one organization or group.

The Dominion Bureau of Statistics reports that median beginning salaries increased for the graduates of all schools, in all types of libraries and regions, from 9.8 to 38.5 per cent, from 1960 to 1965. Salaries for 1966 graduates increased about 10 per cent over

those for 1965 graduates.

## LINGUISTICS

THE study of linguistics, the science of language, is growing rapidly in Canada as elsewhere. The reasons for this are not hard to find. Language, effective communication, is basic to all of man's activities and, as a result, the study of language touches upon many other disciplines.

To the teacher of languages, the new knowledge of language structure that linguistics now provides is an invaluable aid in teaching and research. Especially important in the modern world are the rigorous techniques for the teaching of English as a second language in many parts of the world.

To the anthropologist working in the field, the ability to record, analyse, and acquire a hitherto unrecorded language, which linguistic science provides, is a basic tool. The exciting new discipline, psycholinguistics, which brings together psychological and linguistic techniques in an attempt to understand the working of man's mind through language is now attracting many students.

The President of the Canadian Linguistic Association suggests that the intending linguist should combine the theoretical study of the science of language with another subject. Linguistics and English, linguistics and languages, linguistics and anthropology, linguistics and mathematics, and linguistics and psychology are all suitable combinations. With such combinations, linguists are equipped to teach in schools and universities, to work in the government service as translators, to enter the science of industry in the field of communication engineering, or to teach English overseas.

The number of universities offering programs in linguistics in Canada is growing rapidly. The universities of Alberta, British Columbia, Montreal, and Victoria, and Laval University offer both undergraduate and graduate programs. Most universities in Canada offer individual courses, at both the undergraduate and graduate level, and the President of the Canadian Linguistic Association expects that the number of universities offering both courses and full programs is likely to increase. There are positions in linguistics in Canadian universities which cannot now be filled, and there will undoubtedly be many more. A recommendation

by the Royal Commission of Enquiry on Education in Quebec that every language teacher hold a Bachelor's degree with a high level of specialization in the language to be taught is likely to create an even larger demand on the universities to set up new programs in languages.

## MATHEMATICS

THE majority of Canadian universities offer courses in mathematics at the honours level and about 20 offer graduate work in the field. The 1967 graduating class in honours mathematics is expected to be about one-third larger than the 1966 class, compared to an increase of 28 per cent in the size of the 1966 class over that of 1965.

The demand for mathematics graduates continues to be quite strong, particularly in government and industry. The Department of Labour has estimated that the number of mathematicians in employment will increase by 11 per cent annually for the next few years. The professional opportunities for students with training in mathematics are broad and include the teaching of mathematics, mathematical and applied statistics, applied mathematics in industry, and government service. Some 60 per cent of mathematicians are engaged in teaching, two-thirds of them at the secondary school level.

Other avenues of employment are in the computer field and in the electronic processing of accounting and business information.

The actuarial field is a growing area in which the new graduate in mathematics may find excellent employment opportunities. The Canadian Institute of Actuaries reports that the rapid growth of the insurance industry has resulted in a marked shortage of qualified actuaries. The movement of many Canadian actuaries to positions in the United States has further aggravated the shortage. There are many openings for actuaries in insurance companies, and the increasing numbers of pension plans for business and industry have created many opportunities in the various firms of consulting actuaries, in industry generally, and in government. Eight universities in Canada — British Columbia, Manitoba, Western Ontario, Waterloo, Toronto, Queen's, McGill, and Laval — offer courses in actuarial science.

Salaries for Bachelor graduates in mathe-

matics seem to be somewhat lower than those reported in other science disciplines. However, starting salaries for graduates holding higher degrees in the field generally exceed those offered for other science disciplines.

## MEDICINE

FUTURE prospects for doctors in Canada appear to be excellent. A growing population will continue to swell the demand for medical services. In addition there are increasing opportunities in public health and industrial medicine, prevention and control of disease, promotion of health education, improvement of nutrition, sanitation, and accident prevention. The Canadian Medical Association observes that the supply of physicians must increase at a rapid rate if Canada is to meet the health needs of its population in the coming years.

The Association reports that by 1975, just nine years away, 1,500 new doctors per year will be required to maintain the current physician-population ratio which is about one doctor for every 900 persons. With the existing rate of 850 graduates per year from all Canadian schools, this represents a very large increase in output.

The Association feels that Canada's need for doctors is portrayed by the recommendation of the Royal Commission on Health Services that seven new medical schools should be established within approximately an eight-year period. A number of these schools are now being planned by the universities concerned. In addition, the 12 existing schools are expanding their capacity to the maximum. The University of Sherbrooke will admit medical students for the first time in 1967 or 1968, and McMaster University is in the process of constructing a new medical school.

Concern has been expressed in recent months at the continuing lack of support for medical research in Canada. In a report entitled, *Medical Research in Canada: An Analysis of Immediate and Future Needs*, sponsored by C. L. Gundy of Toronto, and endorsed by the Canadian Society for Clinical Investigation, it is recommended that a more than five-fold increase in the support of medical research is needed for the next four years. This support is necessary, the report states, to encourage medical scientists to remain in Canada in teaching and research, to



attract back to Canadian universities and hospitals many teacher-scientists and graduate students now working elsewhere for lack of opportunity in Canada, and to encourage undergraduates to pursue research in the biomedical sciences as a career. The report warns that failure to provide such support will result in erosion of the standards of Canadian medical schools and the quality of health care provided to the Canadian people.

An increase of just over six per cent is expected in the 1967 graduating class. Twelve Canadian universities offer complete courses leading to the Doctor of Medicine degree, and admission standards remain high. Specialization in medicine requires from three to five years following graduation before the qualifying examinations of the Royal College of Physicians and Surgeons of Canada can be taken.

A vast number of vocations are now open to the qualified physician. He can enter general or specialty practice, carry out research or laboratory work, teach at the university level, or he can enter the medical services of the armed forces or the expanding field of medical administration. A variety of opportunities requiring almost every type of medical specialty is offered as well by the federal government.

Starting salaries for physicians are much higher than those of the other professions and generally start at the \$8,000 range.

## NURSING

THE Executive Director of the Canadian Nurses' Association has made the recommendation that schools of nursing should become increasingly university-oriented. The Association reports that only six per cent of Canada's nurses have the Bachelor's degree in nursing and less than one per cent have a graduate degree. There are now more than 20 universities with established schools of nursing, 19 of which offer a Bachelor's degree. Three universities offer the Master's degree—Western Ontario, McGill, and Montreal. The latter offers the course of study in the French language.

The Hall Royal Commission on Health Services recommended in its report that there should be two streams of nurses in Canada. The first stream, destined for positions as instructors, supervisors, administrators, and for other top jobs in the pro-

fession, would graduate from a four or five-year integrated basic university program. They would eventually fill the 25 per cent of all nursing positions which the Hall report says should be held by university-trained nurses.

The second stream would be graduates of a new type of two-year diploma program and would function as bedside or clinical nurses. The Hall report further recommended the construction of ten more university schools to meet the increasing demand for better-educated nurses. In line with this suggestion, Memorial University of Newfoundland has announced a four-year course leading to a degree in nursing to begin in 1966, and the University of Moncton plans the addition of a nursing school in the very near future. The University of Alberta has announced the reduction of its five-year nursing program to a four-year program beginning in 1966 to bring its training in line with that of other universities.

The newest development in Ontario is the success of four independent schools of nursing which offer two-year courses and operate under a curriculum established by the 24,000 member Registered Nurses Association of Ontario. During 1965 plans were announced by the government of Ontario to alleviate the nursing shortage in that province. The objective of Ontario is to graduate 5,000 nurses per year by 1971, about double the 1966 provincial graduating class. The University of Manitoba has a new nursing program, started in 1964, which is divided into two parts. There is a four-year course for girls coming out of high school and a two-year-plus-two-credits course for registered nurses.

There is still a very serious shortage of qualified nurses, and the ratio of registered nurses to population is still below the ratio of one nurse per 200 population considered desirable by the International Labour Office. It has been observed by hospital officials and organizations concerned that the supply of nurses must increase by more than 20,000 if present standards are to be maintained, and an increase of nearly 42,000 would be desirable if improved standards of patient care are to be provided. The Canadian Nurses Association reports a total of 104,327 professional nurses practising in Canada in 1965, a ratio of one nurse per 188 population.

The shortage extends particularly to personnel in rural areas and in mental hospitals,

and there is a serious lack of nurses with advanced education for senior positions in nursing education, practice, and research.

Hospitals and institutions employ the majority of nursing graduates, but they may also find suitable employment in doctors' offices, in private practice, with government health agencies, in the armed forces, and with home-visiting organizations such as the Victorian Order of Nurses.

Nurses are also employed by international agencies to assist in the organization and development of health services in foreign countries. Rewarding work is offered to nurses as well in outposts maintained by the Canadian Red Cross.

Starting salaries for nurses are steadily improving and vary with training and responsibilities.

## OCCUPATIONAL THERAPY

OCCUPATIONAL therapy has clearly demonstrated its value as an important factor in the treatment of the mentally and physically handicapped.

For the student entering this profession, the employment outlook is excellent. At the present time there is a critical shortage of occupational therapists, and with the ever-increasing demand for qualified personnel in rehabilitation services, the Canadian Association of Occupational Therapists reports little likelihood of these vacancies being filled in the foreseeable future. Membership figures for the Association indicate the number of gainfully-employed occupational therapists in Canada in 1965 as 461 women and 20 men.

Six universities offer courses in occupational therapy — British Columbia, Alberta, Manitoba, Toronto, Montreal, and McGill. The course at Montreal is for bilingual students only. Courses at Toronto and British Columbia are combined with physical therapy, and graduates of these two courses are qualified to practise in both disciplines. In addition, the Canadian Association of Occupational Therapists has established a special course in occupational therapy at Kingston, Ontario, for candidates of advanced educational or professional standing. The program is of eighteen months' duration and is open to suitable applicants with a university degree or diploma, a teacher's cer-

tificate and two years' teaching experience, to registered nurses, or to persons of equivalent qualifications as approved by the Association.

After graduation and completion of the internship required for registration in the professional association, the therapist may then seek employment in a wide variety of fields. These include general, psychiatric, and convalescent hospitals; hospitals for the chronically ill; rehabilitation centres; cerebral palsy clinics; Workmen's Compensation clinics; tuberculosis sanatoria; homes for the aged, and schools for the handicapped.

Occupational therapy is definitely established as an important profession for women. However, with the emphasis on rehabilitation services, there are increasing opportunities and demands for male therapists. Supervisory, administrative, and teaching positions are fairly few in number, although the demand for those who can fill these positions has greatly increased with the expansion and development of hospital departments and training facilities. As well, there are many opportunities for pioneering, for experimenting, and for developing the theories and practices now in use.

As a member of the rehabilitation team, the occupational therapist works closely with the physician, nurse, physical therapist, speech therapist, psychologist, social worker, and other specialists according to the particular needs of the individual patient. The Canadian Association of Occupational Therapists reports that the salary paid to the occupational therapist is comparable to that of other professional personnel with similar educational qualifications.

## OPTOMETRY

THERE are two optometry colleges in Canada, one in Montreal, and the other in Toronto. The School of Optometry in Montreal requires a B.A. degree and instruction is given in French. The College of Optometry of Ontario, operated by the College of Optometrists of Ontario, requires Ontario Grade 13 for entrance to its four-year course. The College of Optometrists of Ontario reports that enrolment in both colleges is at a capacity level with approximately 75 students at Montreal and 100 students at the Toronto school.

The degree, Doctor of Optometry, is

awarded at the Toronto school and the University of Montreal gives the Licentiate in Optometry, but before being eligible to practise, a graduate of either institution must pass the provincial board examinations for the province in which he intends to work.

The optometrist provides complete vision care which will enable the patient not only to see clearly, but also to see with comfort and efficiency. The optometrist is trained to ascertain the absence or presence of refractive errors and to adapt lenses to correct, remedy, or relieve abnormal conditions. Optometrists investigate the presence or absence of abnormal conditions in focusing and adjusting the fixation of the eyes and adapt suitable remedial measures when indicated. Training to become an optometrist includes instruction in adapting lenses, prisms, contact lenses, subnormal vision devices, orthoptic training or co-ordinating exercises to correct, remedy, or relieve the effect of any defect or abnormal condition of the eye or of the two eyes in associated vision. The College of Optometry of Ontario states that 70 per cent of the Canadian public rely on optometrists for complete vision care.

While most optometrists maintain general practices, there are areas of specialization. Some concentrate on child-vision or school-vision problems while others prescribe and fit contact lenses, telescopic, and other low-vision aids for the nearly blind. Optometrists practising in an industrial area may advise on such matters as industrial safety, illumination, or industrial vision. Teaching, research, and highway safety are other areas of work.

The College of Optometry of Ontario reports that the demand for optometrists and optometrical services is high, and that the lack of adequate facilities to expand enrolment is a matter of some concern to the profession. The College further suggests that the increasing shortage of optometrists is reflected by the large number of partnerships and associateships which are available, the increasing case-load of optometrists, and the attractive commencing salaries for new graduates in employed positions.

## PHARMACY

EIGHT Canadian universities maintain colleges or schools offering degree courses in pharmacy (Alberta, British Columbia, Dal-

housie, Laval, Manitoba, Montreal, Saskatchewan, and Toronto). With the exception of Dalhousie, all universities offer advanced studies at the Master's and/or Doctorate level.

Enrolment in the Canadian colleges of pharmacy for the year 1965-66 totalled 1,283 men and 568 women in the undergraduate course, and 59 men and 13 women pursuing graduate studies. The Canadian Pharmaceutical Association marks as a most notable statistic the growing number of women, reaching upwards of 50 per cent in some Canadian colleges, enrolling in the university course in pharmacy. The Dean of the Faculty of Pharmacy at the University of Toronto reports an increase of some 30 per cent in first-year enrolment plus a 50 per cent increase in graduate enrolment. There is every indication, he suggests, that both of these trends will continue. There is an increasing unfilled demand for graduates in hospital pharmacies, industry, and government laboratories.

The demand for candidates with graduate degrees, both Master's and Doctor's, much exceeds the supply for academic positions and industry in particular. Toronto's Dean suggests that Canada can anticipate continuing shortages of candidates for all branches of pharmacy and at the graduate level for the increasing needs of universities as teaching staffs are expanded to provide for the greater pressure of graduate schools.

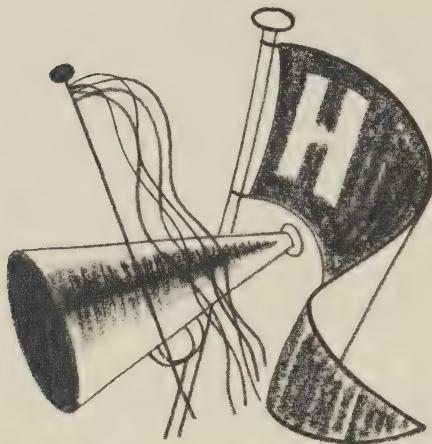
The graduating class of 1966, totalling about 400 students, represents an increase of approximately 20 per cent over 1965. The 1967 graduating class is expected to be about the same size as that of 1966. The Pharmaceutical Association reports that because of the increasing number of women currently registering in pharmacy colleges, and assuming a relatively short female working life, prospects for employment in pharmacy for the next several years look bright.

Almost 80 per cent of new graduates find employment in the retail field. However, a number of pharmacy students, particularly women, find positions in hospital and medical services, as well as with pharmaceutical companies, the Armed Forces, and federal agencies.

Additional opportunities for pharmacists in analytical and toxicology laboratories and in administrative positions as government in-

spectors and health supplies officers have been created by the increased role of federal and provincial governments in public health areas.

Starting salaries for new pharmacists continue to be among the highest offered to all Bachelor graduates and showed an increase of about 10 per cent in 1966 over salaries offered to 1965 graduates.



## PHYSICAL EDUCATION

THERE continues to be a serious lack of professional physical education graduates in school and agency positions normally requiring specialists with professional degrees. The Director of the School of Physical Education and Recreation at the University of British Columbia reports that female physical education teachers are particularly needed, and that there are a considerable number of opportunities available in universities and colleges for women who have taken graduate work. The situation is, however, gradually improving with a steady increase in the enrolment of undergraduates.

A 15 per cent increase in the number of physical education graduates is anticipated in 1967. Eighteen Canadian universities offer courses leading to professional degrees in physical education, health education, and recreation. Of these, two universities offer one-year programs leading to a degree in physical education after a candidate has secured a Bachelor's degree in another area. The Director of the School of Physical and Health Education at the University of Toronto reports that three more universities — Guelph, Laurentian, and York — are in the planning stages

for the establishment of degree courses. The University of Windsor set up two physical education programs in the fall of 1965, a three-year course leading to the Bachelor's degree with a major in an arts subject and a minor in physical education, with an additional year leading to the B.P.H.E. degree. Windsor began the year with a full-time enrolment in the physical education course of close to 40 students, double the number anticipated.

The University of Windsor suggests that future growth in enrolment in the physical and health education courses in Canada should be large. It is estimated that only about 15 per cent of all physical education teachers in Ontario have physical education degrees, and pressure is growing on both the elementary and secondary school levels for teachers and supervisors with proper degrees. It has been suggested that the time is fast approaching when Doctorate degrees will be required for university positions. Junior colleges, large high schools, and government positions will require the Master's degree. The Canadian Association for Health, Physical Education, and Recreation reports that graduate work is now being offered at four Canadian universities (Calgary, British Columbia, Saskatchewan, and Western Ontario). Due to the establishment of these graduate programs, an increasing number of graduates are going on to a second degree in Canada. Opportunities for such graduates are numerous and include advanced teaching, university teaching, recreation, and work in various government departments. It is possible for graduates to go on towards second degrees in research carried on in departments of universities other than physical education, such as medicine, physiology, and psychology.

The Head of the Department of Physical Health and Recreation Education of the University of Western Ontario credits financial assistance available from the Directorate of the National Advisory Council on Fitness and Amateur Sport to both the undergraduate and graduate programs with providing the opportunity for many students to continue their education in the field. The number of students engaged in graduate programs has increased considerably over the number involved in 1966.

The expanding program of the Fitness and Amateur Sport Directorate has resulted in a number of opportunities for graduates as di-

BE = CITY  
CITY = MPS



rectors of programs in the different provinces as well as at the national level. A large part of the budget of the National Advisory Council has been apportioned to research in the field of physical education, recreation, and fitness.

An increasing awareness and interest in the health aspect of athletics and physical education has resulted in an increased demand for practitioners who are knowledgeable and are qualified to administer exercise programs for various age groups under different conditions.

The University of British Columbia points out as well that a number of opportunities are available in the coaching field, especially at colleges and universities in Canada.

There is a re-emphasis of physiology of exercise and training, and more and more communities are seeking professionally trained personnel to serve as directors and supervisors of recreation. The universities of Calgary, British Columbia, and Ottawa are presently providing studies leading to degrees with specialization in recreation.

## PHYSICS

A SURVEY carried out last year through the Canadian Association of Physicists estimated the number of physicists in Canada at 1,341. Of these, just over 34 per cent are Ph.D. graduates.

Canadian universities expect to graduate about 230 students in physics in 1967 compared to a figure of 165 in 1966. In addition, 160 are expected to graduate in mathematics and physics compared with 130 in 1966. The majority of Canadian universities offer courses at the honours level in physics, and at least twenty of these offer graduate work in the field. The University of Moncton is the latest institution to announce the addition of a Master's degree program in physics.

An almost unlimited number of openings for physicists exist today in industrial or government laboratories, in university work, or in meteorology, and there is as well an unlimited demand for qualified secondary school physics teachers in Canada. The survey prepared for the Canadian Association of Physicists estimated that there are just over 40 high school physics teachers in Canada. At the present time, far more secondary school specialists in mathematics and

physics are retiring than are being graduated from the various schools of education.

Slightly more than 10 per cent of Canada's physicists are employed in government service, and most of these are with the Defence Research Board, Atomic Energy of Canada, or the National Research Council. A number of opportunities are available in industry in the fields of electronics, data processing, metal refining, oil prospecting communications, and power development.

Agencies of the federal government are the major employers of graduates seeking specialization in the fields of astronomy and meteorology, and each year a number of graduates enter these particular fields. Honours graduates in mathematics and physics, physics, or engineering physics are employed by the Meteorological Service of Canada. During their first two years of employment with the Service, graduates are required to attend, for two academic sessions, the Master's degree course in meteorology at the University of Toronto or McGill University.

The qualification for teaching at the secondary school level is generally an honours degree in physics, while a graduate degree, preferably a Ph.D. degree, is required for teaching at the university level. A graduate degree is considered essential for advancement in the profession as more than 60 per cent of Canada's physicists have such qualifications. The University of Montreal has a total of 18 Ph.D. level professors in 1966 contrasted to only one in 1945. In comparison, McGill University has nearly 30 Ph.D. science professors in its physics department, while the universities of Toronto and British Columbia each employ nearly 50 professors with Ph.D. degrees.

Salaries for graduate physicists are consistently improving and compare favourably with those of other science disciplines.

## PHYSIOTHERAPY

THE important role of physiotherapists in the rehabilitation of the physically handicapped disabled by disease or accident involving the function of nerves, muscles, bones, and joints has brought about a very great demand for their services.

Two Canadian universities offer the B.Sc. degree in physiotherapy — the University of British Columbia and McGill University.

Both are four-year courses with McGill as well offering a three-year course leading to the B.A. in physiotherapy. In addition, eight universities offer courses — both two- and three-year — leading to a diploma in physiotherapy. These are the universities of British Columbia, Alberta, Saskatchewan, Manitoba, Toronto, Montreal, and Laval and Dalhousie universities. Approximately 300 graduates emerged from these institutions in 1966, still not sufficient, the Canadian Physiotherapy Association reports, to fill the vacant positions.

The work of the physiotherapist is, under medical direction, to help to maintain or restore physical function to an injured or disabled person. Physiotherapy is available to the physically handicapped in hospitals and medical centres in all parts of Canada, and most therapists are employed by these institutions. A number of therapists find employment in the special schools and summer camps operated for the benefit of crippled children. Health programs sponsored by municipal and private welfare agencies are now recognizing the need for physiotherapists in the field of home care.

Salaries for physiotherapists are generally similar to those for occupational therapists, starting at about \$370 for recent diploma graduates.

## POLITICAL SCIENCE

THE separation of political science from economics in even more Canadian universities should bring a further acceleration in the increase of graduates in political science. An increase of more than 40 per cent in 1967 graduation figures over those of 1966 is anticipated. Political science is about to be accorded the full recognition as an independent field of study it has enjoyed in the United States for decades. Nine Canadian universities, Alberta, British Columbia, Carleton, Laval, McGill, Montreal, Ottawa, Queen's, and Toronto, now award the Ph.D. degree in political science.

The most numerous employment opportunities for graduates, particularly for specialists in public administration and international relations, are in government service — international, federal, provincial, and municipal. There are a considerable number of opportunities also in the communications field (press, radio, and television), and in

various areas of social research, primarily those involving the study of political behaviour. Political science graduates are also in a strong position to compete for employment in international business and in the general field of administrative management.

The Head of the Political Science Department for the University of Calgary emphasizes the fact that there are insufficient numbers of political scientists to fill this country's needs and that job opportunities are numerous.

The Acting Head of the Political Science Department at the University of Alberta (Edmonton), reports that university departments of political science are growing rapidly, and graduates with the Ph.D. degree have excellent opportunities for academic appointments at steadily increasing salaries. The M.A. degree is required for teaching appointments at junior colleges. This degree, or at least the honours B.A. with a strong concentration in political science, is a definite asset to graduates seeking appointments in most other areas mentioned in this section.

A number of special programs in political science are being offered by Canadian universities. Carleton offers an interdepartmental program in international affairs, preparing students for careers in government, universities, business, and journalism. Alberta's newly-established Centre for International Studies will afford students an opportunity to do research work in this area in consultation with experts in various fields. Carleton has expanded its program of Soviet and East European studies. Toronto offers specialized work in Soviet studies, and British Columbia in Far Eastern studies.

Waterloo has an honours program which combines the studies of French and political science, and Glendon College of York University will offer a four-year honours program in Canadian affairs emphasizing political science, economics, and sociology. Queen's has an advanced program in Canadian political and electoral behaviour, while Alberta's program in political behaviour extends to political psychology, political sociology, and the analysis of political systems. Windsor has added an inter-disciplinary honours program encompassing Canadian-American relations, Soviet studies, or studies of various developing areas that will lead to the honours B.A. in international relations. The University of Montreal has re-

cently instituted a course in African studies designed to assist those young Canadians planning to work in that area. The course of study will include concentration on such subjects as African law, the evolution of African politics, the religions of Africa, and the economic problems of the continent.

## PSYCHOLOGY

A LARGE increase of close to 50 per cent is anticipated in the 1967 graduating class in honours psychology. At the graduate level a proportionate increase of those receiving degrees is also expected in 1967.

The M.A. degree in psychology, or its academic equivalent, is now the minimum qualification for recognition as a psychologist. It is becoming mandatory to have a Doctor's degree in psychology to merit professional recognition and advancement. The Canadian Psychological Association reports that the higher degree is now specified as a requirement for professional registration in most provincial acts which have been passed. In Ontario, the Psychologists' Registration Act of 1960 carried a clause, which expired in June, 1966, allowing a person with a Master's degree in psychology to be registered as a psychologist following four years' experience and the successful completion of board examinations. With the expiration of the clause, it became mandatory for a candidate for registration to possess the Ph.D. degree and one year of related experience.

More than twenty Canadian universities offer graduate studies leading to either the Master's or the Doctor's degree in psychology. Simon Fraser University has entered a new area of psychology with the combining of psychology and linguistics into a field of study to be known as psycholinguistics. The University is hoping by this method to solve problems of bilingualism that thwart both adults and children.

Opportunities for professional employment in psychology in Canada are encouraging and are likely to remain so. Last year, the Guidance Centre of the Ontario College of Education reported the greatest excess of demand over supply to be in the applied fields, especially clinical psychology. It seems unlikely that this situation has improved since that time.

Child guidance and public mental health clinics have been, and still are, short-staffed

because of the lack of qualified clinical psychologists. Industrial consultant firms frequently advertise for several months before finding suitably trained psychologists. The present demand for psychologists in the universities is not as extreme as it is in other fields. However, projected increases in university enrolments will likely result in an upsurge in the demand for qualified personnel to fill teaching and research positions.

Mental hospitals, universities, and clinics employ the largest number of psychologists, but there are numerous avenues of employment open to those who are professionally qualified. Industry is now turning to the psychologist in the selection, training, and placement of personnel. The school systems are also beginning to employ psychologists in steadily increasing numbers, the Canadian Psychological Association reports.

Some psychologists practise independently, usually as clinical, vocational, or industrial consultants. A number of psychology graduates enter government service or the Armed Forces, usually in the fields of personnel, clinical, or research work.

Some psychology graduates find rewarding employment in the field of educational and vocational guidance where adequate training in psychology is considered to be desirable.

Starting salaries for psychology graduates show a great variation because of the many activities in which psychologists engage, but they are found to be fairly competitive and improving rapidly. The Canadian Psychological Association states that salaries of highly-skilled psychologists still are low in comparison with other professions requiring comparable training.



## SOCIAL WORK

THE number of professional social workers in Canada has increased from approximately 800 in 1945 to 3,000 in 1965. Despite this growth, however, the Canadian Association of Social Workers reports a very serious shortage of professionally qualified social workers, with approximately 1,700 existing vacancies in this field.

The eight schools of social work in Canada are graduating between 250 and 300 students each year. Two new schools have announced plans to open in the fall of 1966, one at Waterloo Lutheran University and the other at the University of Alberta, and it is expected that these will make some contribution towards meeting the demand. The Acting Director of the School of Social Work at the University of Toronto points out, however, that these new schools will add insufficient numbers to the current graduates per year, and that there is a growing interest in undergraduate preparation leading to a B.A. degree with a major in social welfare. Several Ontario universities are considering such programs.

The Canadian Association of Social Workers suggests, too, that interesting developments are taking place with respect to undergraduate university courses to prepare people for a certain level of practice in the welfare field. Several communities have developed, or are considering the development of, technical school courses for the training of welfare workers to do specific jobs.

Opportunities for employment in the social work field are many and varied, and these will increase in number and in diversity as new services are developed under voluntary auspices and as government programs expand. The University of Toronto predicts that changes in and additions to social welfare legislation such as the Child Welfare Act of Ontario, the Canada Pension Plan, and the forthcoming Canada Assistance Plan will intensify the search for trained personnel by social agencies. The additional demand in Ontario created by the above legislation only has been estimated to reach several hundred persons.

There are three major areas of specialization in social work — casework, which involves working with individuals and families; groupwork, involving work with specific

groups, and community organization, where work with the community as a whole is involved. Social workers are employed by government departments at all levels, mainly in the fields of health, welfare, education, and correction. Hundreds of independent voluntary organizations in Canada employ social workers, and those with experience have the opportunity to work in the international welfare field under such auspices as the United Nations and the YM and YWCA. Major fields of service include child and family welfare, vocational rehabilitation, family counselling, neighbourhood services, medical and psychiatric social work, and camping and institutional services for offenders, for the handicapped, and for the very young and the very old. A few social workers are engaged in private practice, and indications are that this is a growing trend.

The Association of Social Workers reports that, with the expansion of schools of social work and the possibility of technical courses being undertaken in the field; there will be a growing demand for teachers of social work. The University of Toronto states that an increasing number of social workers are proceeding to advanced studies in the United States and in Canada at Toronto's School of Social Work. Diplomas in advanced study and, of course, Doctoral degrees are important qualifications for university teaching.

Salaries, working conditions, and opportunities for advancement have improved remarkably over the past few years, and a fully-trained social worker with an M.S.W. degree can command a starting salary of over \$6,000.

## SOCIOLOGY

GRADUATIONS in sociology are rapidly increasing in number and the 1967 class is expected to be almost 75 per cent larger than the 1966 graduating class. This compares with the very large increase of more than 50 per cent noted in 1966.

The recent announcement by the University of Moncton of the commencement of studies in the field of sociology brings to just under twenty the number of Canadian universities offering courses in sociology. Six institutions offer study at the Doctoral level. High academic standing is necessary for professional employment; the Doctor's degree is usually regarded as the requirement for a teacher or researcher in the field.

As a discipline, sociology depends on research which tends to fall into several areas of specialization, such as the study of social stratification, work, inter-group relations, voting, or of organizations and groups.

The services of sociologists in government are now in greater demand than ever before, especially in the social and economics research branches of particular departments. A number of large private firms in industry and commerce now employ sociologists to conduct various staff studies, and professional groups, employers' associations, and workers' unions offer positions to sociology graduates in research work and analytical studies. A considerable number of graduates in sociology find employment in the teaching profession, particularly at the technical, secondary, and university levels, as well as in teacher-training institutions.



Studies carried out by private research agencies in such areas as population shifts and market trends make these agencies particularly attractive as employers of sociology graduates.

The increasing recognition awarded Canada's sociologists will doubtless succeed in bringing the gradually increasing starting salaries in this field considerably higher.

## TOWN PLANNING

THE Town Planning Institute of Canada reports that there is, at present, a very serious shortage of qualified urban and regional planners in both governmental and private practitioners' offices. There is an increasing demand for planners to undertake such work as the preparation of master plans, redevelopment schemes, and regional planning projects.



There are planning schools in the following universities: Montreal, McGill, Toronto, Manitoba, and British Columbia. These schools take only graduate students who may be from a wide variety of disciplines including the social sciences, the humanities, engineering, architecture, and law.

The five schools graduate a total of between 20 and 30 students each year. The programs lead to Master's degrees and diplomas and vary in length between one and two academic years. The Master's degree is the typical professional qualification. It is likely that Ph.D. programs will be available in some universities in the near future.

Generous fellowships are available from the Central Mortgage and Housing Corporation for students wishing to study planning at any one of the five schools. In 1966-67, the value was \$3,000 plus \$500 for dependents.

Planning offers a very wide variety of opportunities to young people. The range extends from research work, perhaps in economics or sociology, to executive work as director of a planning authority. A young planner may find himself doing a survey of part of a town, examining the economic future of towns in a region, preparing an urban renewal project, or trying to solve the problems of a metropolitan downtown area.

The major opportunity for employment is with governmental agencies, primarily at the municipal level. However, there are an increasing number of positions open with private firms. These may include consulting activity or specific planning activity for that firm.

Starting salaries are very good, and

opportunities for advancement are related to professional development and demonstrated skill.

## VETERINARY SCIENCE

THERE are now three existing schools of veterinary medicine in Canada — the Ontario Veterinary College, Guelph; l'Ecole de Médecine veterinaire, St. Hyacinthe, and the new College of Veterinary Medicine at the University of Saskatchewan, Saskatoon. The latter school admitted its first students in the fall of 1965, and now has 33 in the first year of veterinary medicine.

The Canadian Veterinary Medical Association expects that the Saskatchewan college will increase the number of its students within the next few years to approximately 60 students annually. The Ontario Veterinary College has a quota of 80 students in each year of the professional course and l'Ecole de Médecine veterinaire has an annual enrollment of 35 students.

The course format at the Ontario and Saskatchewan colleges is similar, a two-year pre-veterinary course followed by a four-year professional program. At l'Ecole de Médecine veterinaire, the four-year professional program is preceded by a one-year pre-veterinary course that must be taken by students, other than those holding a B.A. degree or its equivalent.

The demand for veterinarians in Canada far exceeds the supply. In part, the demand is high because of the unique undergraduate training which equips the individual for a professional career in animal medicine and at the same time provides the basic training for advanced education in anatomy, medical chemistry, physiology, pharmacology, bacteriology, virology, pathology, parasitology, and preventive medicine. Increasingly, veterinarians are sought by government, industry,

and universities. Their special training allows them to take key roles in all research involving animals.

Veterinarians are placing increasing emphasis on graduate study as they plan careers in research, university teaching, and industry. The number of graduate students at the Ontario Veterinary College numbers 33 for this year, an increase of one-third over 1965, and a forecast of 75 has been made for 1970. Five students are enrolled in graduate studies at l'Ecole de Médecine veterinaire, and three at the Saskatchewan college.

The Canadian Veterinary Medical Association suggests that the federal government is the largest single employer of veterinarians (about 25 per cent), and will continue to require new graduates and experienced veterinarians as the livestock industry expands. Veterinary practice is likely to change in the future because of changes in livestock production. As farm units become larger, herds and flocks will increase in size, but they will be fewer in number. For these reasons, the veterinarians will be emphasizing disease prevention by dealing with herds and flocks as a unit, rather than the treatment of individual animals when disease becomes apparent in them.

The Association further reports a tremendous improvement in veterinary medical education during the past twenty years. Many educators believe that more progress has been made in the quality and status of veterinary medical education than in any other bio-medical field. Today, it is an acknowledged fact that the basic education provided by most veterinary colleges is equal to that of medical schools, and medical educators are being advised to familiarize themselves with the progress being made in this rapidly developing and dynamic branch of the medical sciences.

## **PLACEMENT AND CAREER PLANNING**

THE Department of Manpower and Immigration had established 46 offices of Placement and Career Planning at universities, colleges, and technological institutes by June of 1966. In addition, the establishment of a number of offices at other institutions was under active consideration.

### **Universities and Colleges**

Placement and Career Planning is provided on campus at the 33 listed universities and colleges. The name of the Head of Placement and Career Planning at each institution is also given where this information is available.

#### **NEWFOUNDLAND**

C. B. Barrett

— Memorial University of Newfoundland, St. John's

#### **NOVA SCOTIA**

E. P. Hovell  
G. Beck  
P. A. Poirier

— Acadia University, Kentville  
— Dalhousie University, Halifax  
— St. Mary's University, Halifax

#### **PRINCE EDWARD ISLAND**

E. C. LeClair  
E. C. LeClair

— Prince of Wales College, Charlottetown  
— St. Dunstan's University, Charlottetown

#### **NEW BRUNSWICK**

A. Doig  
W. P. Boucher

— Mount Allison University, Sackville  
— Université de Moncton, Moncton

#### **QUEBEC**

E. Steynor  
J. P. Henderson  
D. Bigger  
Miss M. R. Saindon  
E. Simard  
J. O. LaHaye

— Loyola College, Montreal  
— Macdonald College, Ste. Anne de Bellevue  
— Sir George Williams University, Montreal  
— Université de Montréal, Montréal  
— Université Laval, Quebec  
— Université de Sherbrooke, Sherbrooke

#### **ONTARIO**

M. Ktytor  
T. J. Dignard  
Mrs. T. A. Charlton  
J. P. Kelly  
F. M. Villemaire  
P. Macko  
Miss J. Ciebien

— Lakehead University, Port Arthur  
— Laurentian University, Sudbury  
— McMaster University, Hamilton  
— St. Patrick's College, Ottawa  
— University of Ottawa, Ottawa  
— University of Windsor, Windsor  
— York University, Toronto

#### **MANITOBA**

B. Kardash  
Miss M. L. Matthews

— Brandon College, Brandon  
— United College, Winnipeg  
— University of Manitoba, Winnipeg

#### **SASKATCHEWAN**

W. G. Feader  
W. F. Pickering

— University of Saskatchewan, Saskatoon  
— University of Saskatchewan, Regina

#### **ALBERTA**

J. Lemay  
J. Baker

— University of Alberta, Edmonton  
— University of Calgary, Calgary

## **BRITISH COLUMBIA**

C. S. Hazle

W. Roberts

J. K. Enns

- Notre Dame University, Nelson
- Selkirk College, Castlegar
- Simon Fraser University, Burnaby
- University of Victoria, Victoria
- Vancouver City College, Vancouver

The basic terms of reference used in establishing an office of Placement and Career Planning on campus involve, first of all, an invitation from the university or college to the Department of Manpower and Immigration to open discussions. It is then necessary to determine whether or not the institution is large enough to produce the workload which would warrant the provision of the basic staff required on a full-time basis.

The university or college assigns to the Department full operational responsibility in providing the placement service although the institution does retain the primary responsibility of ensuring that an effective placement service is provided for its students and recruiting employers. The university or college designates one of its faculty, or an administrative officer, to carry out this function and to act in a liaison capacity between it and the Placement and Career Planning centre.

The university or college provides premises and services such as light, heat, messenger and mail services, notice boards, duplicating facilities, telephones, and so forth. The Department of Manpower and Immigration provides staff, furniture and furnishings, office equipment, postage, stationery, long distance telephone, and telex facilities. The Head of Placement and Career Planning at each university or college plays an active part in The University Career Planning Association.

At the Placement and Career Planning centre students desiring assistance in finding suitable employment or who want information on careers are interviewed and given information concerning different occupational areas and the qualifications required to fill positions in these areas. Students may be referred to appropriate local employers directly, to those outside of the local area through placement referral facilities, or interviews may be arranged with recruiters visiting the university or college.

Most of the larger national employers send recruiting teams to universities, colleges, and technological institutes. The recruiting process is continuous throughout the entire year but visits by employers to institutions of higher education are heaviest during two periods. The first of these is November and the first half of December while the second covers the second half of January and February and March.

Each Placement and Career Planning centre is not only involved in the placement of graduating and graduate students in permanent employment and in advising on career opportunities. It also provides assistance in finding summer and part-time employment for all students wishing to obtain such work.

Placement and Career Planning offices are located at the 13 technological institutes in the following list. Three additional institutes, where only part-time on-campus service is provided, are marked with an asterisk.

## **Technological Institutes**

### **NEWFOUNDLAND**

B. Fagan

- Newfoundland College of Trades and Technology, St. John's

### **NEW BRUNSWICK**

A. Hicks

- New Brunswick Institute of Technology, Moncton
- \*Saint John Institute of Technology, Saint John

### **QUEBEC**

R. St. Laurent

A. Dijulio

P. Dorais

- Quebec Institute of Technology, Quebec
- Laval Institute of Technology, Montreal
- Montreal Institute of Technology, Montreal
- \*Institute of Technology, Rimouski

**ONTARIO**

- D. Cody — Eastern Ontario Institute of Technology, Ottawa  
M. Ktytor — Lakehead University, Port Arthur  
A. Miko — Northern Ontario Institute of Technology, Kirkland Lake  
V. C. Kreck — Western Ontario Institute of Technology, Windsor

**MANITOBA**

- Mrs. A. A. Armstrong — Manitoba Institute of Technology, Winnipeg

**SASKATCHEWAN**

- J. Radu — Saskatchewan Technical Institute, Moose Jaw

**ALBERTA**

- D. O'Keefe — Northern Alberta Institute of Technology, Edmonton  
R. E. Hanlan — Southern Alberta Institute of Technology, Calgary

**BRITISH COLUMBIA**

- E. Rumohr — British Columbia Institute of Technology, Burnaby

Technological institutes provide an alternative educational path beyond secondary school to that offered by universities and colleges. Accordingly the offices of Placement and Career Planning are established on the same basis as at universities and colleges.

A separate *Career Outlook* booklet relating to the graduates of technological institutes is published and is available on request.

## **APPENDIX**

THE following tables are drawn from a variety of sources. Those concerning starting salaries were obtained from a survey of national employers conducted during the fall of 1965 and from a survey of personnel engaged in the placement of university students in employment in 1966.

The table concerning estimated graduations is drawn primarily from a survey conducted by the Higher Education Division of the Dominion Bureau of Statistics. However, considerable data was also provided by other organizations, including the Engineering Institute of Canada.

The table on graduate enrolments in the sciences was developed from a survey conducted in 1966 by the National Research Council.

### **Starting Salaries**

Starting salaries offered to those graduating in 1966 generally showed a higher percentage increase over 1965 starting salaries than was the case in the preceding year, when starting salaries for those graduating in 1965 were compared with those of 1964. Only a few disciplines in 1965 showed increases of the order of 10 per cent over salaries offered to 1964 graduates, compared with more than 20 disciplines showing salary increases in excess of 10 per cent in 1966 over those offered to 1965 graduates. Starting salaries for students graduating with a Master's degree in mathematics and physics were approximately 20 per cent higher in 1966 than they were during the preceding year. Increases of the order of 15 per cent are noted for those graduating with Master's degrees in electrical and mechanical engineering and for those graduating with Master's degrees in home economics and in mining engineering. The increase in starting salaries offered to graduates in mining engineering are in sharp contrast to the relatively small increases in salaries offered to 1965 graduates, as compared with 1964 graduates. Generally speaking the starting salaries for those obtaining Doctorates in 1966 did not show the same marked increase as for those graduating with Bachelor's and Master's degrees. The most substantial percentage increase noted at the Doctorate level was that of approximately eight per cent for those obtaining a Doctorate in engineering physics.

The table of estimated monthly starting salaries was obtained by combining information obtained basically from two surveys. One of these was a survey of more than 300 employers active in recruiting university graduates. These employers were surveyed in the fall of 1965 before they had actually started to interview graduating students and had made firm offers. In the spring of 1966 personnel at universities and colleges reported on the results of employer recruiting. The two surveys were combined with other information available and the composite table was produced as shown in this booklet. No figures are given where there was insufficient information obtained to provide a valid estimate of starting salaries.

It should be noted that these salaries are averages, covering all types of employment for graduates of a particular discipline. Rates for particular fields of employment or for students with special qualifications would naturally differ from those in the table.

### **Estimated Graduations**

Table two estimates the number of students expected to graduate by discipline from each of the larger universities and colleges in Canada. The estimates for graduates in engineering in Table One were obtained from the Engineering Institute of Canada. Although most of the information in Table One was obtained from a survey conducted by the Higher Education Division of the Dominion Bureau of Statistics, some information was supplied directly by a few universities. The estimated totals for each discipline are not actual totals of the figures for each institution in the column. Information relating to graduations for particular years was not available for some of the universities and colleges. In estimating total graduations for all of the institutions listed, allowances were

made in those instances where information was not available for a particular institution. Only those students studying at the main centre of the university are included in the estimates for that institution. Students at affiliated institutions located elsewhere were not included.

Generally speaking, the increase in the number of graduations anticipated in 1967, as compared with 1966, is of the order of 15 to 20 per cent. Either a small decline in the number of anticipated graduations, or only a small increase of 10 per cent or less, is noted for a few disciplines. These are music, modern languages and literature, geology and geophysics, agricultural engineering, civil engineering, geological engineering and mineralogy, metallurgical engineering, mining engineering, engineering physics, forestry and forestry engineering, business administration and commerce, dentistry, medicine, nursing, and social work. Quite substantial increases in enrolments are expected in a few disciplines, amounting to an increase of 25 per cent or more. These disciplines are fine arts and theatre, English and English literature, French and French literature, economics, political science, psychology, biochemistry, biological sciences, zoology, mathematics, mathematics and physics, physics, chemical engineering, electrical engineering, mechanical engineering, agriculture, education, and home economics.

## **Graduate Enrolments**

Following Table Two are graduate student enrolment tables in the sciences which are based on a survey carried out by the National Research Council. These tables give enrolments for different sections by disciplines and universities. The enrolments are divided between two levels, those studying for Master's degrees and those studying for Doctorates. These tables do not give anticipated graduations. However, they are useful as an indication of those universities offering studies in particular disciplines and do give a sign of growth rate in enrolments in particular disciplines.

Increases in enrolment between 1964-65 and 1965-66, of the order of 25 per cent or more, are noted in a number of science disciplines. Among these are chemistry, mathematics, physics, metallurgy, electrical engineering, biochemistry, and most of the life sciences. These increases are noted in enrolments for both Master's and Doctor's degrees. Substantial enrolment increases of the same magnitude are noted at the Doctor's level for civil engineering and mechanical engineering but much smaller enrolment increases are noted at the Master's level.

A number of sciences report relatively small enrolment increases or actual declines in enrolment at both the Master's and Doctor's levels. Among these are geology, geography, and the other earth sciences except for geophysics and geodesy where enrolment increases of somewhat more than 20 per cent are noted. Architecture, microbiology, zoology, and most of the engineering disciplines also recorded modest enrolment increases or declines.

Approximately one third of those studying for Doctorates were non-Canadian students, while more than one quarter of those studying for Master's degrees were non-Canadians. A very small percentage of the total enrolment was made up of part-time students. They accounted for slightly more than five per cent of the Doctorate students and about 10 per cent of those studying for Master's degrees.

**TABLE ONE 1966 University Graduates**

(Estimated Monthly Starting Salaries)

THESE estimates of the monthly starting salaries for those who graduated in 1966 are based on information obtained directly from the larger national employers and from Placement and Career Planning offices. These estimates were obtained before graduation and the commencement of employment.

DISCIPLINE	BACHELORS \$ per month	MASTERS \$ per month	DOCTORS \$ per month
Arts, General, and Pass Courses.....	426	—	—
Honours Economics.....	469	545	691
Honours English.....	479	515	667
Honours French.....	486	532	—
Honours History.....	481	521	632
Honours Modern Languages.....	486	520	692
Honours Political Science.....	464	551	—
Honours Psychology.....	442	519	668
Honours Sociology.....	443	541	720
Science, General, and Pass Courses.....	449	—	—
Honours Bacteriology.....	489	—	—
Honours Biochemistry.....	480	588	733
Honours Biology.....	471	547	727
Honours Chemistry.....	502	576	775
Honours Chemistry & Physics.....	486	579	770
Honours Food Chemistry.....	473	—	—
Honours Geography.....	505	540	720
Honours Geology.....	513	589	716
Honours Geophysics.....	516	567	—
Honours Mathematics.....	492	577	738
Honours Mathematics & Physics.....	493	620	735
Honours Mathematics, Physics, & Chemistry.....	500	—	—
Honours Microbiology.....	476	552	725
Honours Physics.....	510	569	739
Chemical Engineering.....	527	602	784
Civil Engineering.....	522	577	768
Electrical Engineering.....	518	617	762
Engineering Physics.....	526	591	755
Geological Engineering.....	545	—	—
Industrial Engineering.....	536	—	—
Mechanical Engineering.....	526	607	779
Metallurgy & Metallurgical Engineering.....	532	592	760
Mining Engineering.....	551	—	—
Survey Engineering.....	535	—	—
Agriculture.....	474	566	—
Architecture.....	532	—	—
Commerce and Business Administration.....	473	579	—
Commerce for CA Articles only.....	406	—	—
Forestry and Forestry Engineering.....	511	—	—
Home Economics.....	438	—	—
Journalism.....	404	—	—
Law.....	503	—	—
Law, for Law Articles only.....	239	—	—
Library Science.....	470	—	—
Social Work.....	446	487	—
Education.....	442	527	—
Education, Undergraduate Diploma.....	327	—	—
Physical Education.....	469	—	—
Dentistry (D.D.S.).....	751	—	—
Nursing, plus R.N.....	412	—	—
Nursing, Undergraduate Diploma & R.N.....	329	—	—
Pharmacy.....	540	—	—
Physiotherapy, Undergraduate Diploma.....	380	—	—
Speech Therapy.....	426	—	—

**ESTIMATED GRADUATIONS BY DISCIPLINES (1966-67)—TABLE TWO**

University or College	PASS AND GENERAL						HONOURS ARTS AND SCIENCE									
	Arts		Science		Fine Arts and Theatre		Music		English and English Lit.		French and French Lit.		Modern Lang. and Lit.		History	
	66	67	66	67	66	67	66	67	66	67	66	67	66	67	66	67
Acadia.....(1)	162	157	70	79	—	—	3	2	4	3	1	—	—	—	2	2
Dalhousie.....(2)	160	230	114	164	2	—	—	—	4	1	2	—	3	3	2	1
Memorial.....(3)	82	100	43	49	—	—	—	—	4	8	1	3	—	—	3	4
Mount Allison....(4)	120	123	30	37	8	8	6	8	6	2	2	1	—	—	4	5
Mt. St. Vincent...(5)	68	111	7	4	—	—	—	—	—	—	—	—	—	—	—	—
N.S. Tech.....(6)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
St. Dunstan's....(7)	51	88	13	25	—	—	—	—	—	—	—	—	—	—	—	—
St. F. Xavier....(8)	159	184	47	61	—	—	—	—	—	—	—	—	—	—	—	—
St. Mary's.....(9)	56	64	16	21	—	—	—	—	—	1	—	—	—	—	1	4
Moncton.....(10)	90	83	—	4	—	—	—	—	—	—	—	—	—	—	—	—
U.N.B.....(11)	230	224	27	44	—	—	—	—	13	19	—	1	1	2	8	7
Bishop's.....(12)	70	80	22	40	—	—	—	—	—	—	—	—	—	—	—	—
Jean-de-Brébeuf.....(13)	99	106	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Laval.....(14)	325	400	—	—	—	—	7	19	11	14	40	50	8	10	41	32
Loyola.....(15)	101	168	47	59	—	—	—	—	8	18	—	—	—	3	10	—
McGill.....(16)	317	394	306	441	5	6	11	22	29	33	14	12	5	8	12	16
Marianopolis.....(17)	57	84	10	13	—	—	—	—	—	—	—	—	—	—	—	—
Montreal.....(18)	2037	2539	—	—	—	—	57	—	23	—	—	—	—	—	67	80
Ste. Marie.....(19)	168	215	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Sherbrooke.....(20)	77	79	6	29	—	—	—	—	—	—	—	—	—	—	—	—
Sir George Wms.(21)	545	540	220	201	—	—	—	—	4	6	—	—	—	5	4	—
Brock.....(22)	—	44	—	15	—	—	—	—	—	—	—	—	—	—	—	—
Carleton.....(23)	320	372	91	126	—	—	—	—	9	6	1	3	2	2	7	6
Guelph.....(24)	—	40	—	26	—	—	—	—	—	—	—	—	—	—	—	—
Lakehead.....(25)	63	102	13	26	—	—	—	—	—	3	—	2	—	—	2	5
Laurentian.....(26)	125	214	24	39	—	—	—	—	—	—	—	—	—	—	—	—
McMaster.....(27)	221	296	155	169	2	4	—	—	22	21	13	19	4	2	11	29
Ottawa.....(28)	410	452	35	42	—	—	—	—	4	7	18	22	—	—	—	—
Queen's.....(29)	408	368	45	57	—	—	—	—	23	25	14	10	2	4	27	25
R.M.C.....(30)	30	27	38	30	—	—	—	—	2	5	3	6	—	4	5	—
St. Patrick's.....(31)	120	171	17	—	—	—	—	—	—	3	—	2	—	—	—	—
Toronto.....(32)	1117	1150	192	296	14	18	31	35	86	96	8	9	109	95	108	105
Trent.....(33)	—	71	—	22	—	—	—	—	—	—	—	—	—	—	—	—
Waterloo.....(34)	134	174	85	101	—	—	—	—	5	8	6	12	1	—	11	14
Waterloo Luth... (35)	250	423	21	41	—	—	—	—	5	24	5	14	—	3	18	—
Western.....(36)	714	739	138	192	—	—	26	19	28	25	11	6	16	5	27	28
Windsor.....(37)	281	246	59	68	—	—	—	—	5	11	2	14	—	3	4	—
York & Osgoode.(38)	106	160	1	1	—	—	—	—	—	20	—	2	—	—	—	24
Calgary.....(39)	191	231	85	148	—	2	6	2	—	—	—	—	1	5	—	3
Alberta (Edm.)...(40)	353	392	270	399	4	9	20	17	9	22	—	—	5	4	5	5
Brandon.....(41)	44	100	34	49	—	—	—	3	—	—	—	—	—	—	—	—
Manitoba.....(42)	454	884	288	294	17	26	1	8	6	9	4	6	2	1	7	3
Notre Dame.....(43)	12	24	4	5	—	—	—	—	3	3	2	—	—	9	8	—
Sask. (Reg.)....(44)	50	65	50	65	5	—	5	—	6	10	—	—	—	—	3	5
Sask. (Sask.)....(45)	420	445	280	320	1	1	5	—	5	3	2	1	—	1	5	—
Simon Fraser....(46)	—	19	—	9	—	—	—	—	—	—	—	—	—	—	—	—
U.B.C.....(47)	755	832	410	475	7	3	43	36	27	48	—	—	12	19	9	7
United.....(48)	295	280	77	240	—	—	—	—	9	5	—	—	—	3	4	—
Victoria.....(49)	123	139	61	76	—	—	—	—	9	7	—	2	—	1	—	6

Estimated Totals      11895 14345 3451 4290 65 85 220 240 370 495 150 200 170 160 390 475

**ESTIMATED GRADUATIONS BY DISCIPLINES (1966-67)—TABLE TWO (CONT.)**

**HONOURS ARTS AND SCIENCE**

Anthrop. and Soci- ology	Econ.		Pol. Science		Psych- ology		Bio- chem.		Bio- logical Sciences		Zoology		Chem- istry		Geog- raphy		Geology and Geo- physics		University		
	66	67	66	67	66	67	66	67	66	67	66	67	66	67	66	67	66	67	(1)		
— —	2	—	4	2	—	—	—	—	3	3	—	—	1	2	—	—	—	—	(1)		
— —	—	—	1	—	3	—	1	3	8	8	—	—	3	12	—	—	—	—	(2)		
1	3	2	2	—	—	1	3	—	6	8	—	—	3	3	—	—	—	—	(3)		
— —	1	—	—	—	1	—	—	—	3	2	—	—	3	5	—	—	—	—	(4)		
— —	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	(5)		
— —	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	(6)		
— —	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	(7)		
— —	—	—	—	—	—	—	—	—	—	—	—	—	3	3	—	—	—	—	(8)		
— —	—	—	1	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	(9)		
— —	—	—	1	4	1	3	3	4	—	—	2	1	—	—	3	—	—	—	(10)		
1	3	—	1	4	1	3	3	4	—	—	—	—	1	—	—	—	—	—	(11)		
— —	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	(12)		
— —	—	—	—	—	—	—	—	—	3	8	2	6	—	—	3	14	18	22	—		
19	25	26	28	6	17	28	30	17	22	11	26	3	8	18	21	7	12	4	2	(16)	
88	230	29	68	29	59	52	72	4	9	24	35	7	8	40	46	39	40	7	11	(17)	
— —	—	—	—	—	—	—	—	—	—	10	23	—	—	5	4	—	—	—	—	(19)	
1	1	4	9	—	—	—	—	—	—	—	2	2	4	6	—	—	—	—	(21)		
— —	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	(22)		
2	2	2	1	6	6	4	8	—	—	3	4	—	—	2	4	1	5	3	2	(23)	
— —	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	(24)		
— —	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	(25)		
2	4	7	6	5	7	3	6	—	6	6	10	—	—	6	7	13	12	—	2	(27)	
43	21	15	18	43	21	—	—	2	3	16	20	3	5	25	24	—	—	2	3	(28)	
— —	13	12	9	15	4	9	2	4	11	10	—	—	9	21	1	11	4	6	(29)		
— —	12	17	6	10	—	—	—	—	—	—	—	—	—	—	—	—	—	—	(30)		
— —	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	(31)		
42	45	61	63	—	—	35	31	—	—	60	55	—	—	28	38	17	19	8	9	(32)	
2	1	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	(33)		
— —	—	4	—	4	—	5	—	—	2	4	—	—	5	8	3	15	—	—	(34)		
— —	13	16	4	—	4	15	—	—	—	—	—	—	—	—	—	15	19	—	(35)		
— —	9	10	4	8	12	13	—	—	15	14	—	—	19	18	19	11	4	7	(36)		
— —	1	5	2	—	1	6	7	1	1	—	—	—	—	3	3	—	2	—	(37)		
— —	10	—	8	—	10	—	16	—	—	7	—	—	—	—	—	—	—	—	(38)		
3	3	2	3	3	5	3	—	—	1	—	—	2	2	5	—	1	1	—	(39)		
4	1	4	2	—	6	4	12	3	3	4	10	5	10	11	7	4	—	7	1	(40)	
— —	6	2	3	1	—	4	—	1	7	3	5	10	10	15	—	—	4	6	(42)		
2	5	—	—	—	2	2	—	—	—	1	1	3	3	—	—	—	—	—	(43)		
— —	3	2	4	—	4	8	10	—	2	4	6	—	—	7	10	—	—	—	(44)		
3	5	1	4	3	3	4	5	3	4	14	13	—	—	8	10	—	—	3	3	(45)	
— —	4	7	14	14	8	14	8	7	11	8	15	12	21	23	28	28	4	5	12	11	(47)
— —	2	3	—	2	3	3	6	—	—	1	5	—	—	9	3	2	1	—	(48)		
— —	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	(49)		
215	375	240	305	140	200	185	270	45	75	225	285	50	90	270	330	140	165	60	65		

**ESTIMATED GRADUATIONS BY DISCIPLINES (1966-67)—TABLE TWO (CONT.)**

University or College	HONOURS ARTS AND SCIENCE								APPLIED SCIENCE AND ENGINEERING							
	Math.		Math. and Physics		Physics		Others		Agricul- tural		Chem- ical		Civil		Elec- trical	
	66	67	66	67	66	67	66	67	66	67	66	67	66	67	66	67
Acadia.....(1)	3	3	—	—	1	—	—	—	—	—	—	—	—	—	—	—
Dalhousie.....(2)	7	2	—	—	11	10	1	1	—	—	—	—	—	—	—	—
Memorial.....(3)	—	3	—	2	3	4	—	—	—	—	—	—	—	—	—	—
Mount Allison... (4)	2	8	—	—	2	—	4	—	—	—	—	—	—	—	—	—
Mt. St. Vincent... (5)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
N.S. Tech.....(6)	—	—	—	—	—	—	—	—	—	—	7	13	47	35	32	40
St. Dunstan's....(7)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
St. F. Xavier....(8)	2	2	—	—	—	4	—	—	—	—	—	—	—	—	—	—
St. Mary's.....(9)	—	—	—	—	—	—	1	—	—	—	—	—	—	—	—	—
Moncton.....(10)	—	—	—	—	3	—	—	—	—	—	—	—	—	—	—	—
U.N.B.....(11)	1	—	—	—	2	—	4	2	—	—	18	7	25	28	28	33
Bishop's.....(12)	—	—	—	—	—	—	35	35	—	—	—	—	—	—	—	—
Jean-de-Brébeuf ..(13)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Laval.....(14)	50	54	—	—	18	26	75	42	—	2	20	29	47	56	37	32
Loyola.....(15)	—	4	—	—	4	6	1	7	—	—	—	2	—	12	—	13
McGill.....(16)	10	18	—	15	12	24	10	8	8	6	22	22	14	20	58	86
Marianopolis....(17)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Montreal.....(18)	52	104	2	5	25	47	275	325	—	—	26	31	61	56	42	45
Ste. Marie.....(19)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Sherbrooke.....(20)	—	—	—	—	—	4	—	—	—	—	—	—	15	8	19	12
Sir George Wms.(21)	—	2	3	4	—	—	—	—	—	—	—	—	—	—	—	—
Brock.....(22)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Carleton.....(23)	9	6	3	1	1	4	4	2	—	—	—	—	15	15	16	15
Guelph.....(24)	—	—	—	—	—	—	—	—	18	27	—	—	—	—	—	—
Lakehead.....(25)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Laurentian.....(26)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
McMaster.....(27)	10	11	5	1	5	7	9	9	—	12	10	12	11	9	9	—
Ottawa.....(28)	2	3	—	—	5	7	—	—	—	7	5	9	6	17	14	—
Queen's.....(29)	7	9	14	12	5	5	5	8	—	27	29	40	41	42	50	—
R.M.C.....(30)	—	—	6	5	—	—	—	—	—	20	20	17	17	19	19	—
St. Patrick's....(31)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Toronto.....(32)	—	—	59	65	—	56	47	—	—	50	82	49	42	58	85	—
Trent.....(33)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Waterloo.....(34)	8	9	27	33	—	4	4	—	20	57	37	63	45	69	—	—
Waterloo Luth....(35)	—	—	—	—	—	—	7	3	—	—	—	—	—	—	—	—
Western.....(36)	17	17	—	—	8	5	8	5	—	7	15	16	13	12	14	—
Windsor.....(37)	6	6	—	—	8	2	—	—	—	5	9	11	15	6	8	—
York & Osgoode.(38)	—	—	—	—	—	—	—	18	—	—	—	—	—	—	—	—
Calgary.....(39)	3	2	—	1	2	4	3	2	—	—	—	—	—	—	—	—
Alberta (Edm.)...(40)	12	5	—	—	17	12	43	28	—	24	42	40	49	48	48	—
Brandon.....(41)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Manitoba.....(42)	10	13	5	3	7	12	3	2	—	—	—	36	41	42	44	—
Notre Dame.....(43)	—	2	—	—	2	—	1	2	—	—	—	—	—	—	—	—
Sask. (Reg.)....(44)	2	5	2	4	2	4	—	—	—	—	—	—	—	—	—	—
Sask. (Sask.)....(45)	10	11	—	—	4	6	8	8	13	12	12	9	27	32	29	53
Simon Fraser....(46)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
U.B.C.....(47)	20	23	2	10	12	23	12	5	—	24	31	19	35	52	55	—
United.....(48)	1	—	—	—	—	—	1	2	—	—	—	—	—	—	—	—
Victoria.....(49)	4	10	—	—	8	4	—	—	—	—	—	—	—	—	—	—
Estimated Totals	250	330	130	160	165	220	570	585	40	45	300	410	535	595	610	740

<sup>1</sup>Agricultural Engineering, Agriculture, Home Economics, and diploma graduates in Physical Education and Education are located on the Macdonald College campus of McGill University.

**ESTIMATED GRADUATIONS BY DISCIPLINES (1966-67)—TABLE TWO (CONT.)**

APPLIED SCIENCE AND ENGINEERING										MISCELLANEOUS COURSES										
Geolo- gical and Miner- ology	Mech- anical		Metal- lurgical		Mining		Physics		Others		Forestry and Forestry Eng.		Agricul- ture		Architec- ture		Bus. Admin. and Comm.			
	66	67	66	67	66	67	66	67	66	67	66	67	66	67	66	67	66	67		
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	28	28	(1)		
—	—	—	—	—	—	—	4	2	—	—	—	—	—	—	—	58	68	(2)		
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	22	32	(3)		
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	22	24	(4)		
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	(5)		
—	5	44	37	2	10	3	5	—	—	25 <sup>2</sup>	—	—	—	—	4	9	—	—	(6)	
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	11	7	(7)		
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	41	36	(8)		
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	20	32	(9)		
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	30	40	(10)		
—	—	18	15	—	—	—	—	—	5	5 <sup>3</sup>	43	31	—	—	—	31	49	(11)		
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	7	19	(12)		
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	(13)		
8	7	30	34	7	18	4	6	21	6	25	19 <sup>3</sup>	18	27	39	49	15	13	244 215	(14)	
—	—	4	—	—	—	—	—	—	—	—	—	—	—	—	—	56	67	(15)		
—	—	34	36	6	2	2	—	—	—	—	—	—	70	106	16	22	79	94	(16)	
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	(17)		
3	4	55	67	14	10	5	4	11	21	—	—	—	—	—	—	24	16	93 84	(18)	
—	—	6	12	—	—	—	—	—	—	—	—	—	—	—	—	27	35	(20)		
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	210	256	(21)			
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	(22)		
—	—	23	23	—	—	—	—	—	—	—	—	—	—	—	—	39	51	(23)		
—	—	—	—	—	—	—	—	—	—	—	128	159	—	—	—	—	—	(24)		
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	(25)		
—	—	8	13	1	9	—	—	5	9	—	—	—	—	—	—	4	6	(26)		
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	4	22	(27)		
—	—	4	1	29	39	13	17	8	5	6	7	—	13	—	—	—	110	58	(28)	
—	—	—	—	23	22	—	—	—	2	9	—	—	—	—	—	—	27	18	(29)	
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	(30)		
—	—	4	9	49	69	16	6	9	2	42	46	35	45	19	24	—	27	51	62 90	(32)
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	(33)		
—	—	—	—	47	82	—	—	—	—	—	—	—	—	—	—	—	—	(34)		
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	21	29	(35)		
—	—	—	—	15	7	—	1	—	—	—	—	—	—	—	—	49	80	(36)		
—	—	—	—	8	16	—	—	—	—	5	1	—	—	—	—	28	41	(37)		
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1	1	(38)		
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	52	49	(39)		
3	—	53	45	9	7	—	5	2	—	—	—	—	52	53	—	—	151	141	(40)	
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	(41)		
—	2	1	51	45	—	—	—	2	7	—	—	—	40	55	33	28	87	90	(42)	
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	(43)		
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	(44)		
—	5	2	29	51	—	—	6	3	8	6	13	12	—	57	63	—	—	112 110	(45)	
—	9	1	28	45	21	25	4	7	9	11	—	—	40	36	50	49	20	24	133 215	(47)
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1	—	(48)	
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	(49)		
35	35	550	660	90	105	40	40	110	125	85	120	120	120	435	535	140	160	1875	2100	

<sup>2</sup>Industrial Engineering Graduates

<sup>3</sup>Survey Engineering Graduates

**ESTIMATED GRADUATIONS BY DISCIPLINES (1966-67)—TABLE TWO (CONT.)**

University	MISCELLANEOUS COURSES																		
	EDUCATION						LIBRARY SCIENCE						NURSING						
	Dentistry	Under-graduate Diplomas		Graduate Diplomas & Degrees		Home Economics		Law	Bachelor Degrees		Masters Degrees		Medicine (M.D.)		College Diplomas		Bachelor Degrees		
	66	67	66	67	66	67	66	67	66	67	66	67	66	67	66	67	66	67	
(1)	—	—	15	—	27	—	17	19	—	—	—	—	—	—	—	—	—	—	
(2)	24	25	21	—	121	—	—	—	43	62	—	—	56	65	127	—	7	5	
(3)	—	—	—	—	176	256	—	—	—	—	—	—	—	—	—	—	—	—	
(4)	—	—	—	—	14	—	19	19	—	—	—	—	—	—	—	—	—	—	
(5)	—	—	—	—	19	—	7	9	—	—	—	—	—	—	—	—	8	5	
(6)	—	—	46	50	—	—	—	—	—	—	—	—	—	—	—	—	—	—	
(7)	—	—	22	19	—	—	—	—	—	—	—	—	—	—	—	—	—	—	
(8)	—	—	—	—	93	—	13	17	—	—	—	—	—	—	—	—	—	3	
(9)	—	—	—	—	20	—	—	—	—	—	—	—	—	—	—	—	—	—	
(10)	—	—	—	—	14	7	—	—	—	—	—	—	—	—	—	—	—	—	
(11)	—	—	—	—	31	—	—	—	16	19	—	—	—	—	—	—	16	21	
(12)	—	—	—	—	15	—	—	—	—	—	—	—	—	—	—	—	—	—	
(13)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	
(14)	—	—	—	—	80	95	40	46	66	70	—	—	—	119	133	—	—	—	
(15)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	
(16)	—	—	298	346	195	239	37	29	52	62	—	—	20	37	96	100	165	—	
(17)	—	—	—	—	—	—	—	3	—	—	—	—	—	—	—	—	89	—	
(18)	49	55	715	844	580	—	26	27	117	123	96	—	—	109	111	55	—	17	
(19)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	
(20)	—	—	46	59	61	92	—	—	12	24	—	—	—	—	—	—	—	—	
(21)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	
(22)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	
(23)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	
(24)	—	—	—	—	—	67	70	—	—	—	—	—	—	—	—	—	—	—	
(25)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	
(26)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	
(27)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	19	14	
(28)	—	—	28	35	—	—	12	10	74	90	35	38	1	2	50	53	256	250	
(29)	—	—	—	—	—	—	—	32	63	—	—	—	57	47	4	—	8	14	
(30)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	
(31)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	
(32)	121	114	180	—	730	—	27	24	113	120	153	—	16	—	157	134	89	—	
(33)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	33	78	
(34)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	
(35)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	
(36)	—	—	176	—	—	—	5	16	49	48	—	—	—	54	60	110	—	68	
(37)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	72	—	26	14	
(38)	—	—	—	—	—	—	—	—	148	167	—	—	—	—	—	—	—	—	
(39)	—	—	—	—	204	208	—	—	—	—	—	—	—	—	—	—	—	—	
(40)	50	48	—	—	313	528	29	46	39	53	—	—	—	58	75	56	—	40	
(41)	—	—	—	—	—	26	—	—	—	—	—	—	—	—	—	—	—	—	
(42)	25	27	603	—	190	—	60	90	32	39	—	—	—	50	65	44	—	19	
(43)	—	—	21	14	1	10	—	—	—	—	3	5	—	—	—	—	—	—	
(44)	—	—	683	825	64	100	—	—	—	—	—	—	—	—	—	—	—	—	
(45)	—	—	—	—	398	410	29	38	42	40	—	—	—	29	45	72	—	43	
(46)	—	—	22	—	—	6	—	—	—	—	—	—	—	—	—	—	—	—	
(47)	—	—	293	—	330	624	54	47	85	99	68	—	—	55	56	68	—	30	
(48)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	
(49)	—	—	319	—	66	152	—	—	—	—	—	—	—	—	—	—	—	—	
	270	270	3490	4115	3740	5360	440	510	920	1080	355	390	35	65	890	945	1120	—	455
																		465	

**ESTIMATED GRADUATIONS BY DISCIPLINES (1966-67)—TABLE TWO (CONCL.)**

**MISCELLANEOUS COURSES**

OCCUP. & PHYSIOTHERAPY		PHYSICAL EDUCATION						Secretar- ial Science	SOCIAL WORK				University or College		
		Pharmacy		Diplomas	Degrees	Bachelor Degrees	Masters Degrees		Bachelor Degrees	Masters Degrees					
66	67	66	67	66	67	66	67	66	67	66	67	66	67		
—	—	—	—	—	—	—	—	11	20 <sup>4</sup>	—	—	—	(1) Acadia		
16	16	—	—	14	19	—	—	—	—	—	—	—	(2) Dalhousie		
—	—	—	—	—	—	—	5	10	—	—	—	—	(3) Memorial		
—	—	—	—	—	—	—	—	12	14	—	—	—	(4) Mount Allison		
—	—	—	—	—	—	—	—	3	8	—	—	—	(5) Mt. St. Vincent		
—	—	—	—	—	—	—	—	—	—	—	—	—	(6) Prince of Wales		
—	—	—	—	—	—	—	—	—	—	—	—	—	(7) St. Dunstan's		
—	—	—	—	—	—	—	—	—	—	—	—	—	(8) St. F. Xavier		
—	—	—	—	—	—	—	—	—	—	—	—	—	(9) St. Mary's		
—	—	—	—	—	—	—	—	—	—	—	—	—	(10) Moncton		
—	—	—	—	—	—	—	43	47	—	—	—	—	(11) U.N.B.		
—	—	—	—	—	—	—	—	—	—	—	—	—	(12) Bishop's		
—	—	—	—	—	—	—	—	—	—	—	—	—	(13) Jean-de-Brébeuf		
—	—	18	—	33	18	—	20	22	—	41	—	33	36		
16	—	29	22	—	—	49	58	11	9	—	—	43	—		
66	67	—	—	49	50	—	—	77	60	—	—	72	76		
—	—	—	—	—	—	—	—	—	—	—	—	—	(17) Marianopolis		
—	—	—	—	—	—	—	—	—	—	—	—	—	(18) Montreal		
—	—	—	—	—	—	—	—	—	—	—	—	—	(19) Ste. Marie		
—	—	—	—	—	—	—	—	—	—	—	—	—	(20) Sherbrooke		
—	—	—	—	—	—	—	—	—	—	—	—	—	(21) Sir George Wms.		
—	—	—	—	—	—	—	—	—	—	—	—	—	(22) Brock		
—	—	—	—	—	—	—	—	—	—	—	—	—	(23) Carleton		
—	—	—	—	—	—	—	—	—	—	—	—	—	(24) Guelph		
—	—	—	—	—	—	—	—	—	—	—	—	—	(25) Lakehead		
—	—	—	—	—	—	—	—	—	—	—	—	—	(26) Laurentian		
—	—	—	—	—	—	—	79	—	—	—	—	—	(27) McMaster		
—	—	—	—	—	—	—	56	25	—	—	—	—	(28) Ottawa		
—	—	—	—	—	—	—	14	47	—	—	—	—	(29) Queen's		
—	—	—	—	—	—	—	—	—	—	—	—	—	(30) R.M.C.		
78	84	—	—	90	82	—	37	61	—	103	—	93	—		
—	—	—	—	—	—	—	—	—	—	—	—	—	(31) St. Patrick's		
—	—	—	—	—	—	—	52	—	—	—	—	—	(32) Toronto		
—	—	—	—	—	—	—	—	—	—	—	—	—	(33) Trent		
—	—	—	—	—	—	—	23	36	29	47	—	—	(34) Waterloo		
—	—	—	—	—	—	—	5	—	—	—	—	—	(35) Waterloo Luth.		
—	—	—	—	—	—	—	—	—	—	—	—	—	(36) Western		
—	—	—	—	—	—	—	—	—	—	—	—	—	(37) Windsor		
—	—	—	—	—	—	—	—	—	—	—	—	—	(38) York & Osgoode		
—	—	—	—	—	—	—	18	21	—	—	—	—	(39) Calgary		
28	24	—	—	26	60	—	87	89	—	—	—	—	(40) Alberta (Edm.)		
—	—	—	—	—	—	—	—	—	—	—	—	—	(41) Brandon		
34	37	—	—	28	20	—	—	52	—	66	—	56	—		
—	—	—	—	—	—	—	—	6	24	—	—	—	(42) Manitoba		
—	—	—	—	—	—	—	—	—	—	—	—	—	(43) Notre Dame		
—	—	—	—	—	—	—	—	—	—	—	—	—	(44) Sask. (Reg.)		
—	—	—	—	—	—	—	26	26	—	—	—	—	(45) Sask. (Sask.)		
—	—	—	—	—	—	—	—	—	—	—	—	—	(46) Simon Fraser		
—	—	—	—	32	41	28	—	44	58	—	93	—	(47) U.B.C.		
—	—	—	—	—	—	—	—	—	—	—	—	—	(48) United		
—	—	—	—	—	—	—	—	—	—	—	—	—	(49) Victoria		
240	265	45	70	345	345	50	55	595	710	45	704	300	— 390	425	Estimated Totals

<sup>4</sup>Graduates in Secretarial Science with diplomas from Acadia and Notre Dame total 17 in 1966 and 24 in 1967, in addition to the totals for those obtaining degrees.

**GRADUATE DEGREE ENROLMENT,  
ENGINEERING AND SCIENTIFIC DISCIPLINES—TABLE 3**

University or College	PHYSICAL SCIENCES										EARTH SCIENCES							
	CHEMISTRY				MATHEMATICS				PHYSICS				GEOLOGY					
	Masters	Doctors	Masters	Doctors	Masters	Doctors	Masters	Doctors	Masters	Doctors	Masters	Doctors	Masters	Doctors	Masters	Doctors	Masters	Doctors
	64-65	65-66	64-65	65-66	64-65	65-66	64-65	65-66	64-65	65-66	64-65	65-66	64-65	65-66	64-65	65-66	64-65	65-66
Acadia.....(1)	3	5	—	—	2	3	—	—	—	—	—	—	—	—	1	4	—	—
Dalhousie.....(2)	14	17	12	13	9	17	—	—	12	11	4	9	4	7	—	—	—	—
Memorial.....(3)	8	8	—	—	2	1	—	—	4	4	—	—	6	9	—	—	—	—
Moncton.....(4)	4	3	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Mount Allison.....(5)	3	5	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
New Brunswick.....(6)	5	7	20	25	1	1	1	—	4	3	1	—	17	9	3	4	—	—
Nova Scotia Tech... (7)	—	—	—	—	—	—	—	2	—	1	—	1	—	—	—	—	—	—
St. Francis Xavier... (8)	10	8	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Bishop's.....(9)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Laval.....(10)	6	9	18	18	2	3	1	1	8	16	10	12	1	1	10	1	—	—
McGill.....(11)	29	19	84	91	21	21	26	29	26	24	35	30	18	24	32	29	—	—
Montreal.....(12)	22	30	26	28	18	25	12	14	11	29	7	14	3	9	—	—	—	—
Sherbrooke.....(13)	—	4	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Carleton.....(14)	15	17	1	3	3	9	2	2	7	11	6	4	8	6	7	10	—	—
Guelph.....(15)	5	6	—	—	—	—	—	—	3	5	—	—	—	—	—	—	—	—
McMaster.....(16)	29	20	26	42	8	10	13	18	31	33	37	52	8	6	5	8	—	—
Ottawa.....(17)	14	14	30	27	4	11	4	1	8	17	5	5	3	9	4	7	—	—
Queen's.....(18)	19	29	16	27	13	16	6	5	13	14	4	5	21	17	12	16	—	—
Toronto.....(19)	58	88	66	79	38	41	40	50	50	52	59	72	13	10	11	10	—	—
Waterloo.....(20)	13	21	5	12	—	—	—	—	8	14	6	13	—	—	—	—	—	—
Waterloo Luth.....(21)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Western.....(22)	10	11	52	54	11	13	4	14	17	22	18	16	7	10	10	9	—	—
Windsor.....(23)	10	5	5	9	4	5	—	5	9	6	5	25	—	—	—	—	—	—
York.....(24)	—	—	—	—	—	—	—	—	—	3	—	—	—	—	—	—	—	—
Calgary .....	11	11	16	22	8	9	2	2	4	10	6	11	1	8	1	—	—	—
Alberta (Edm.)....(26)	27	33	74	83	8	31	18	23	23	24	15	24	22	13	16	17	—	—
British Columbia....(27)	29	44	58	80	29	34	20	30	41	51	58	66	17	19	13	14	—	—
Manitoba.....(28)	12	14	12	21	18	20	—	—	19	13	7	15	7	17	8	10	—	—
Sask. (Saskatoon)....(29)	18	23	20	23	8	7	7	8	15	17	32	33	10	8	5	5	—	—
Simon Fraser.....(30)	—	—	—	7	—	2	—	4	—	—	—	13	—	—	—	—	—	—
Total	374	451	541	664	207	279	156	208	313	380	315	420	167	186	137	140	—	—

**GRADUATE DEGREE ENROLMENT,  
ENGINEERING AND SCIENTIFIC DISCIPLINES—TABLE 3 (CONT.)**

EARTH SCIENCES												ENGINEERING							
GEOPHYSICS AND GEODESY				GEOGRAPHY				OTHER EARTH SCIENCES				TOTAL EARTH SCIENCES				AERONAUTICAL ENGINEERING			
Masters	Doctors	Masters	Doctors	Masters	Doctors	Masters	Doctors	Masters	Doctors	Masters	Doctors	Masters	Doctors	Masters	Doctors	Masters	Doctors		
64-65	65-66	64-65	65-66	64-65	65-66	64-65	65-66	64-65	65-66	64-65	65-66	64-65	65-66	64-65	65-66	64-65	65-66		
—	—	—	—	—	—	—	—	—	—	1	4	—	—	—	—	—	—		
1	2	—	1	—	—	—	—	12	3	11	10	17	12	11	11	—	—		
2	3	—	—	—	—	—	—	2	—	—	—	8	14	—	—	—	—		
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	(2)		
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	(3)		
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	(4)		
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	(5)		
—	—	—	—	—	—	—	—	6	—	2	—	23	9	5	4	—	—		
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	(6)		
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	(7)		
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	(8)		
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	(9)		
—	6	—	1	—	—	—	—	20	—	3	—	21	7	13	2	3	—		
2	2	2	5	15	5	12	5	32	50	15	24	67	81	61	63	—	—		
—	—	1	13	14	2	4	—	—	—	16	23	2	5	—	—	—	(10)		
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	(11)		
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	(12)		
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	(13)		
1	—	—	—	—	—	—	—	1	1	2	5	10	7	9	15	9	10		
—	—	—	—	—	—	—	—	13	13	—	1	13	13	—	1	2	(14)		
—	—	—	19	—	1	—	4	7	9	10	31	13	15	18	—	—	(15)		
—	—	—	—	—	7	—	—	—	—	—	3	16	4	7	—	—	(16)		
—	—	2	—	1	—	—	—	—	7	—	1	21	26	12	18	—	(17)		
—	2	7	13	12	11	1	9	—	19	16	3	4	47	34	36	26	(18)		
—	1	—	—	—	—	—	—	—	—	—	—	—	1	—	—	5	(19)		
—	—	—	—	—	2	—	—	—	—	—	—	2	—	—	—	—	(20)		
8	6	6	5	22	23	7	8	1	4	3	4	38	43	26	26	—	(21)		
—	—	—	—	—	—	—	—	2	—	—	2	—	—	—	—	—	(22)		
—	—	—	—	—	—	—	—	—	—	—	2	—	—	—	—	—	(23)		
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	(24)		
6	—	4	—	6	2	—	1	—	1	—	1	13	11	5	2	—	(25)		
4	5	—	2	28	17	3	4	6	3	3	2	60	38	22	25	—	(26)		
7	14	6	8	16	3	7	7	12	5	12	9	52	41	38	38	7	7		
1	1	2	2	2	7	—	1	13	2	2	4	26	18	9	12	—	(27)		
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	(28)		
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	(29)		
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	(30)		
36	49	33	38	132	103	41	30	146	116	67	75	481	454	278	283	36	49		
																30	37		

**GRADUATE DEGREE ENROLMENT,  
ENGINEERING AND SCIENTIFIC DISCIPLINES—TABLE 3 (CONT.)**

University or College	ENGINEERING AND APPLIED SCIENCES															
	CHEMICAL ENGINEERING				CIVIL ENGINEERING				ELECTRICAL ENGINEERING				INDUSTRIAL ENGINEERING			
	Masters	Doctors	Masters	Doctors	Masters	Doctors	Masters	Doctors	Masters	Doctors	Masters	Doctors	Masters	Doctors	Masters	Doctors
	64-65	65-66	64-65	65-66	64-65	65-66	64-66	65-66	64-65	65-66	64-65	65-66	64-65	65-66	64-65	65-66
Acadia.....(1)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Dalhousie.....(2)	—	—	—	—	—	—	—	—	—	—	1	—	—	—	—	—
Memorial.....(3)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Moncton.....(4)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Mount Allison.....(5)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
New Brunswick.....(6)	13	17	5	7	20	15	—	—	26	25	2	5	—	—	—	—
Nova Scotia Tech... (7)	4	3	1	1	20	13	6	9	23	31	1	6	—	—	—	—
St. Francis Xavier... (8)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Bishop's.....(9)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Laval.....(10)	9	7	1	1	24	13	3	3	23	17	6	7	—	—	—	—
McGill.....(11)	3	13	15	12	36	19	7	6	19	18	18	19	—	—	—	—
Montreal.....(12)	2	2	2	1	15	15	—	—	6	8	2	—	—	—	—	—
Sherbrooke.....(13)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Carleton.....(14)	—	—	—	—	5	18	—	—	18	45	1	5	—	—	—	—
Guelph.....(15)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
McMaster.....(16)	16	14	7	10	10	14	—	—	6	12	1	2	—	—	—	—
Ottawa.....(17)	16	11	5	5	—	—	—	—	14	12	13	11	—	—	—	—
Queen's.....(18)	5	6	5	7	19	12	5	6	16	17	3	3	—	2	—	—
Toronto.....(19)	23	26	26	30	36	43	11	14	62	65	25	26	16	22	11	9
Waterloo.....(20)	10	21	4	8	30	45	15	32	18	24	12	15	—	5	—	2
Waterloo Luth.....(21)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Western.....(22)	6	5	—	3	7	1	—	3	1	—	—	—	—	—	—	—
Windsor.....(23)	5	12	4	1	8	5	2	2	8	13	—	1	—	—	—	—
York.....(24)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Calgary.....(25)	—	—	—	—	11	14	1	3	—	1	—	—	—	—	—	—
Alberta (Edm.)....(26)	19	18	11	12	38	34	5	6	26	29	2	7	—	—	—	—
British Columbia....(27)	6	8	5	6	19	18	5	4	26	29	11	20	—	—	—	—
Manitoba.....(28)	—	—	—	—	28	45	—	—	36	48	—	—	—	—	—	—
Sask. (Saskatoon)....(29)	4	6	6	6	21	19	—	—	13	13	4	7	—	—	—	—
Simon Fraser.....(30)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	141	169	97	110	347	343	60	88	341	408	101	134	16	29	11	11

**GRADUATE DEGREE ENROLMENT,  
ENGINEERING AND SCIENTIFIC DISCIPLINES—TABLE 3 (CONT.)**

ENGINEERING AND APPLIED SCIENCES

MECHANICAL ENGINEERING		METALLURGY		MINING AND PETROLEUM ENGINEERING		OTHER ENGINEERING		TOTAL ENGINEERING		University
Masters	Doctors	Masters	Doctors	Masters	Doctors	Masters	Doctors	Masters	Doctors	
64-65	65-66	64-65	65-66	64-65	65-66	64-65	65-66	64-65	65-66	(1)
—	—	—	—	—	—	—	—	—	—	(2)
—	—	—	—	—	—	—	—	—	1	(3)
—	—	—	—	—	—	—	—	—	—	(4)
—	—	—	—	—	—	—	—	—	—	(5)
4	4	—	—	—	—	—	—	11	3	(6)
8	10	1	1	2	2	1	3	—	63	72
—	—	—	—	—	—	1	—	—	57	7
—	—	—	—	—	—	—	—	60	21	(7)
—	—	—	—	—	—	—	—	—	—	(8)
—	—	—	—	—	—	—	—	—	—	(9)
11	7	1	3	3	5	7	8	—	77	54
18	18	18	15	2	7	5	7	8	88	24
3	9	1	2	4	5	2	2	3	39	26
—	—	—	—	—	—	—	—	—	43	(10)
—	—	—	—	—	—	—	—	—	7	(11)
—	—	—	—	—	—	—	—	—	5	(12)
—	—	—	—	—	—	—	—	—	—	(13)
7	12	—	4	—	—	—	—	—	39	85
10	13	—	—	22	19	12	16	—	15	12
—	—	—	—	—	—	—	—	—	15	14
—	—	—	—	—	—	—	—	—	64	72
—	—	—	—	—	—	—	—	—	30	23
—	—	—	—	—	—	—	—	—	18	16
12	8	1	3	9	8	—	1	3	64	56
21	26	19	26	8	13	16	16	—	190	136
15	7	8	12	—	2	—	1	—	225	154
—	—	—	—	—	—	—	—	—	117	136
—	—	—	—	—	—	—	—	—	39	71
10	4	—	—	—	2	—	—	—	—	(20)
6	6	—	1	—	2	—	—	—	24	12
—	—	—	—	—	—	—	—	—	6	(22)
—	—	—	—	—	—	—	—	27	38	5 (23)
—	—	—	—	—	—	—	—	—	—	(24)
1	9	—	—	—	—	—	—	—	12	24
11	15	3	3	7	2	3	4	12	116	110
11	10	—	3	12	22	11	18	8	24	33
7	7	—	—	—	—	—	—	—	32	(26)
26	33	10	12	—	—	—	2	1	82	59
—	—	—	—	—	—	—	—	—	71	(27)
—	—	—	—	—	—	—	—	—	100	(28)
—	—	—	—	—	—	—	—	73	83	22 (29)
—	—	—	—	—	—	—	—	—	28	(30)
181	198	62	85	69	89	57	75	23	15	1204
—	—	—	—	—	—	—	—	60	1370	429
—	—	—	—	—	—	—	—	6	563	—

**GRADUATE DEGREE ENROLMENT,  
ENGINEERING AND SCIENTIFIC DISCIPLINES—TABLE 3 (CONT.)**

**ENGINEERING AND APPLIED SCIENCES**

University	ARCHITECTURE AND COMMUNITY PLANNING				BIOCHEMISTRY				MICROBIOLOGY IMMUNOLOGY, ETC.				PHARMACY				PSYCHOLOGY			
	Masters	Doctors	Masters	Doctors	Masters	Doctors	Masters	Doctors	Masters	Doctors	Masters	Doctors	Masters	Doctors	Masters	Doctors	Masters	Doctors		
	64-65	65-66	64-65	65-66	64-65	65-66	64-65	65-66	64-65	65-66	64-65	65-66	64-65	65-66	64-65	65-66	64-65	65-66		
(1)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—		
(2)	—	—	—	—	13	9	10	12	—	4	5	2	5	—	—	—	33	28	7	15
(3)	—	—	—	—	1	—	—	—	1	1	—	—	—	—	—	—	—	—	—	—
(4)	—	—	—	—	—	—	1	—	—	—	—	—	—	—	—	—	—	—	—	—
(5)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
(6)	—	—	—	—	—	—	—	—	3	2	—	—	—	—	—	—	4	8	—	—
(7)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
(8)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
(9)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
(10)	—	—	—	—	1	2	11	9	2	1	3	1	1	1	2	2	—	—	—	1
(11)	12	9	—	—	38	46	46	64	8	12	27	23	10	—	3	1	32	37	30	35
(12)	—	—	—	—	4	11	10	6	14	24	3	2	18	13	2	4	167	178	33	37
(13)	—	—	—	—	—	—	—	—	1	—	—	—	—	—	—	—	—	—	—	—
(14)	—	—	—	—	1	—	1	—	1	—	1	—	—	—	—	—	12	22	—	—
(15)	—	—	—	—	—	3	—	—	16	19	—	2	—	—	—	—	—	—	—	—
(16)	—	—	—	—	1	3	1	3	2	—	—	—	—	—	—	—	13	20	16	17
(17)	—	—	—	—	4	3	10	7	—	3	—	1	—	—	—	—	51	46	25	24
(18)	—	—	—	—	4	8	2	2	5	7	1	4	1	—	2	—	25	24	22	21
(19)	19	38	—	—	11	13	14	11	7	7	5	6	17	9	5	3	23	23	22	23
(20)	—	—	—	—	3	3	—	—	1	3	2	3	—	—	—	—	24	47	30	45
(21)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
(22)	—	—	—	—	7	12	14	20	—	1	2	4	3	—	4	—	40	44	19	25
(23)	—	—	—	—	4	3	2	3	4	2	—	1	—	—	—	—	7	23	—	7
(24)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	11	—
(25)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	10	18	—	—
(26)	—	—	—	—	13	9	20	24	6	4	—	3	18	8	9	5	29	38	11	15
(27)	32	23	—	—	8	10	8	15	6	8	1	2	7	9	2	—	16	12	9	8
(28)	17	18	—	—	10	16	4	11	14	7	10	2	16	6	14	—	4	11	4	2
(29)	—	—	—	—	4	5	3	2	—	4	—	—	—	1	—	6	4	2	2	1
(30)	—	—	—	—	—	—	—	3	—	—	—	—	—	—	—	—	—	—	—	—
	80	88	—	—	127	157	156	192	90	107	62	56	96	46	44	15	496	604	230	278

**GRADUATE DEGREE ENROLMENT,  
ENGINEERING AND SCIENTIFIC DISCIPLINES—TABLE 3 (CONC.)**

LIFE SCIENCES												TOTALS				University or College					
ZOOLOGY				OTHER LIFE SCIENCES				TOTAL LIFE SCIENCES		ALL SCIENCES*											
Masters	Doctors	Masters	Doctors	Masters	Doctors	Masters	Doctors	Masters	Doctors	Masters	Doctors										
64-65	65-66	64-65	65-66	64-65	65-66	64-65	65-66	64-65	65-66	64-65	65-66	64-65	65-66	64-65	65-66						
—	—	—	—	5	8	—	—	5	8	—	—	11	20	—	—	(1) Acadia					
1	—	1	—	9	24	4	16	60	65	27	45	112	123	54	78	(2) Dalhousie					
7	10	—	—	6	9	—	—	15	20	—	—	37	47	—	—	(3) Memorial					
—	—	—	—	—	—	—	—	—	1	—	—	4	4	—	—	(4) Moncton					
—	—	—	—	13	—	—	—	13	—	—	—	16	5	—	—	(5) Mount Allison					
—	1	—	—	14	21	—	1	21	32	—	1	117	124	34	45	(6) New Brunswick					
—	—	—	—	—	—	—	—	—	—	—	—	57	61	10	24	(7) Nova Scotia Tech.					
—	—	—	—	—	—	—	—	—	—	—	—	10	8	—	—	(8) St. Francis Xavier					
—	—	—	—	—	—	4	—	—	—	4	—	—	—	4	—	(9) Bishop's					
—	5	1	2	42	49	27	29	46	58	44	44	160	147	110	103	(10) Laval					
10	17	5	7	132	178	87	107	230	290	198	237	473	542	470	512	(11) McGill					
1	8	1	1	15	39	5	10	219	273	54	60	325	423	108	126	(12) Montreal					
—	—	—	—	—	3	—	—	—	4	—	—	—	8	—	—	(13) Sherbrooke					
—	—	—	—	12	16	10	11	26	38	11	12	100	167	30	47	(14) Carleton					
1	1	—	1	81	96	—	20	98	119	—	23	134	157	—	24	(15) Guelph					
5	—	—	—	12	11	8	12	33	34	25	32	196	182	136	190	(16) McMaster					
—	2	—	2	9	16	13	17	65	67	51	50	124	148	112	106	(17) Ottawa					
1	2	1	—	22	38	29	29	68	77	57	56	198	218	111	132	(18) Queen's					
8	21	5	15	88	142	80	97	144	225	131	155	546	703	468	536	(19) Toronto					
—	—	—	2	7	8	3	4	35	61	35	54	129	214	85	150	(20) Waterloo					
—	—	—	—	—	—	—	—	—	—	—	—	2	—	—	—	(21) Waterloo Luth.					
10	8	2	7	27	44	35	34	87	111	76	90	187	212	176	206	(22) Western					
—	1	—	—	4	3	—	—	19	32	2	11	69	88	18	56	(23) Windsor					
—	—	—	—	—	1	—	—	—	12	—	—	—	15	—	—	(24) York					
3	—	—	—	3	14	—	2	16	32	—	2	64	97	30	42	(25) Calgary					
24	5	20	2	87	119	34	70	177	183	94	119	411	419	247	307	(26) Alberta (Edm.)					
17	15	15	17	87	103	61	69	141	157	96	111	406	448	302	384	(27) British Columbia					
9	—	1	—	65	89	39	54	118	129	72	69	269	334	101	115	(28) Manitoba					
2	7	1	1	36	63	27	39	48	83	34	44	188	232	124	148	(29) Sask. (Saskatoon)					
—	—	—	—	—	5	—	4	—	5	—	8	—	7	—	32	(30) Simon Fraser					
99	103	53	57	776	1103	462	625	1684	2120	1007	1223	4343	5159	2726	3363	Total					

\*Two Doctorate and 17 Master's degree students, included in the totals for 1965-66, do not appear in any of the columns for individual disciplines of study or groups of such disciplines.









